US 20080077458A1

(19) **United States**

(12) **Patent Application Publication**

Andersen et al.

(10) **Pub. No.: US 2008/0077458 A1**

(43) **Pub. Date: Mar. 27, 2008**

(54) **COLLECTING AND REPRESENTING HOME ATTRIBUTES**

(76) Inventors: **Timothy J. Andersen**, Seattle, WA (US); **Fred F. Sadaghiani**, Seattle, WA (US); **Stephen M. McNamee**, Renton, WA (US); **Marcin Szuster**, Seattle, WA (US); **Chloe L. Harford**, Seattle, WA (US); **Jeffrey T. Brinker**, Seattle, WA (US); **Randy W. Puttick**, Mercer Island, WA (US)

Correspondence Address:
PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

(21) Appl. No.: **11/524,047**

(22) Filed: **Sep. 19, 2006**

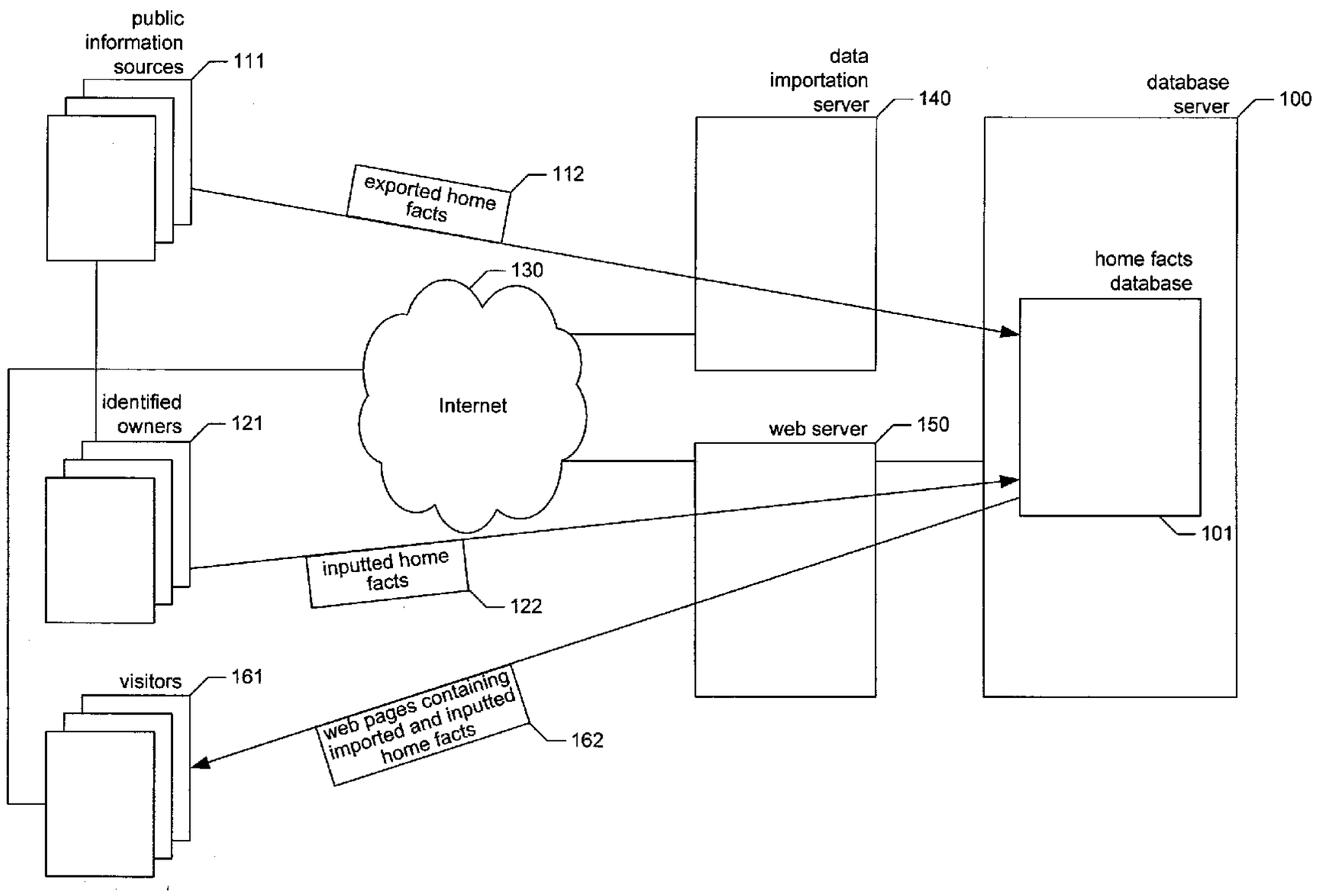
Publication Classification

(51) **Int. Cl.**
G06F 9/44 (2006.01)
G06F 17/30 (2006.01)

(52) **U.S. Cl.** **705/7**; 707/1

(57) **ABSTRACT**

A facility for representing home attribute values for a plurality of homes and a plurality of home attributes is described. The facility incorporates a data structure comprising, for each of the plurality of homes, for each of the plurality of attribute value sources, the capacity to store values for any of the plurality of home attributes obtained from the attribute value source.



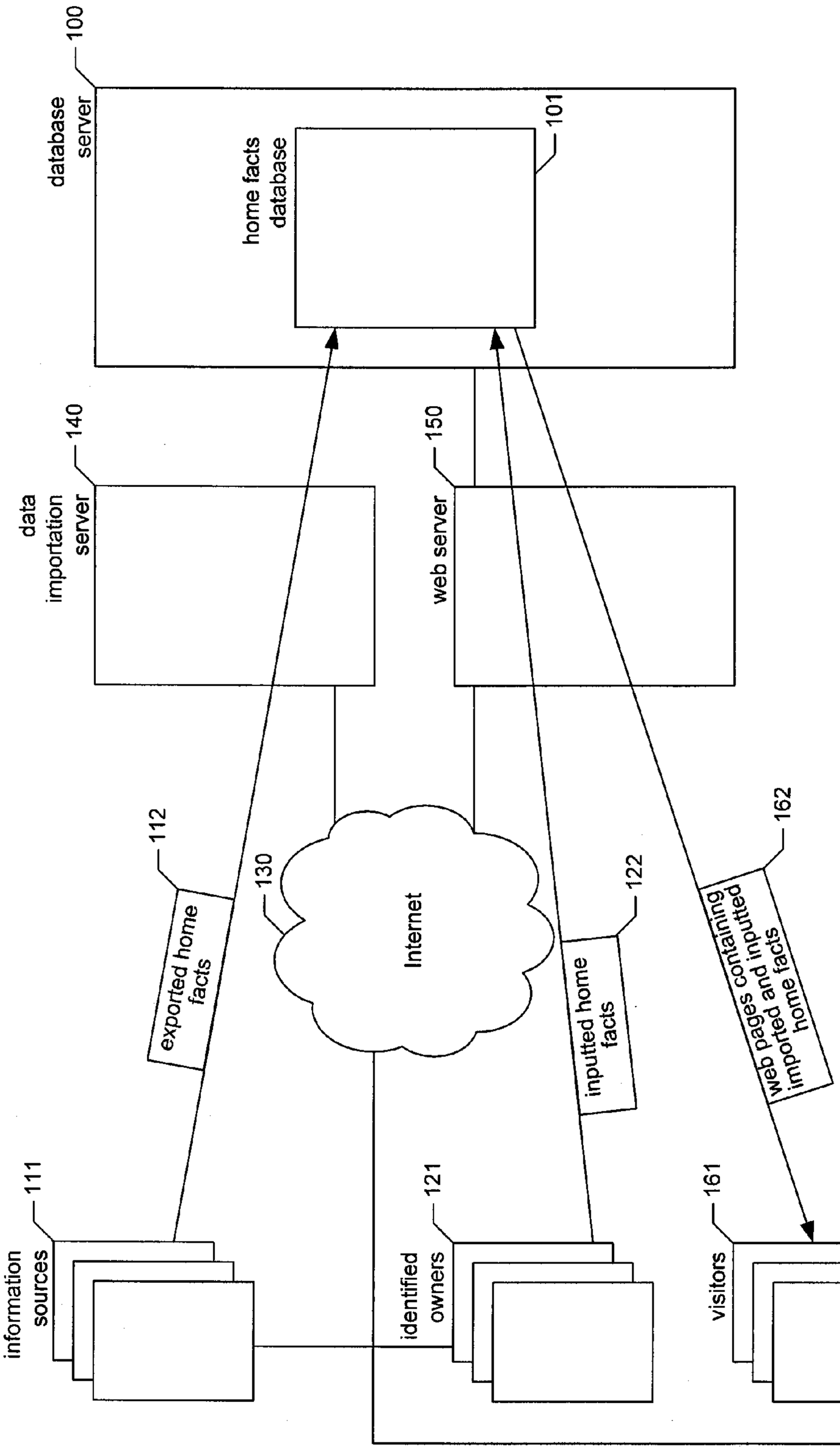

100
database server
101
home facts database
data importation server
140
web server
150
112
exported home facts
130
Internet
122
inputted home facts
162
web pages containing imported and inputted home facts
public information sources
111
identified owners
121
visitors
161

FIG. 1

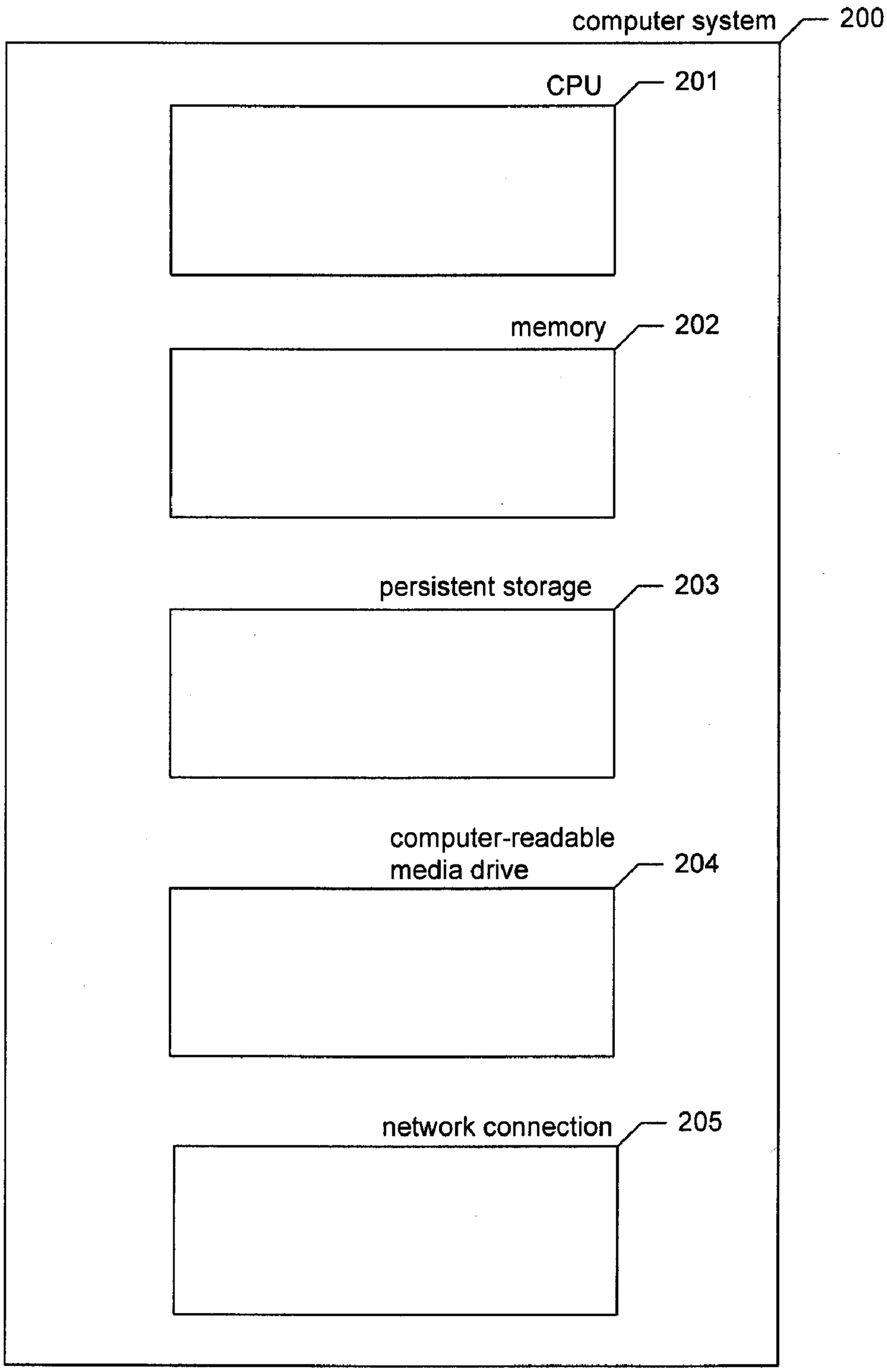

computer system
200
CPU
201
memory
202
persistent storage
203
computer-readable
media drive
204
network connection
205

FIG. 2

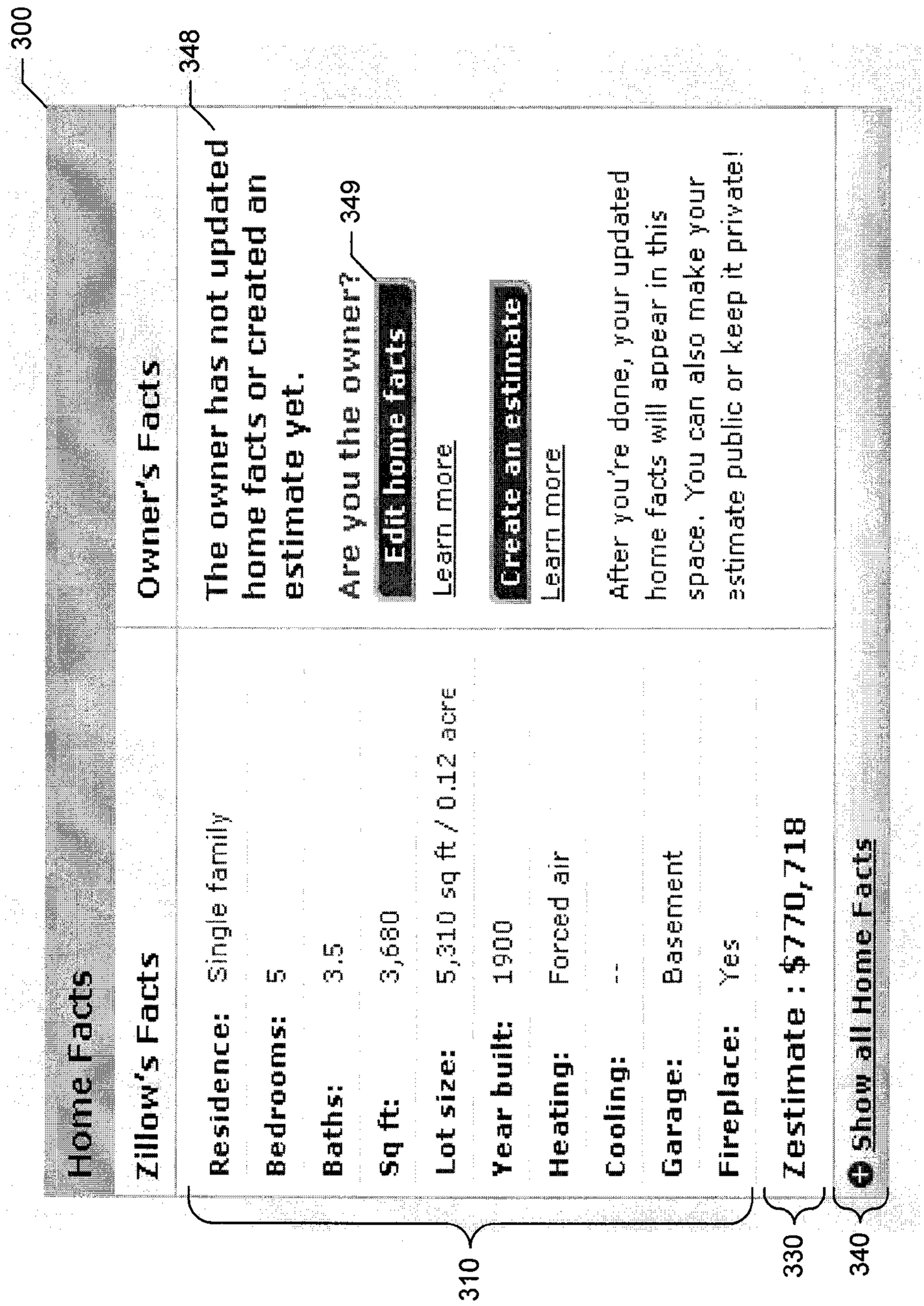

300
348
Owner's Facts
The owner has not updated home facts or created an estimate yet.
Are you the owner?
349
Edit home facts
Learn more
Create an estimate
Learn more
After you're done, your updated home facts will appear in this space. You can also make your estimate public or keep it private!
Home Facts
Zillow's Facts
Residence: Single family
Bedrooms: 5
Baths: 3.5
Sq ft: 3,680
Lot size: 5,310 sq ft / 0.12 acre
Year built: 1900
Heating: Forced air
Cooling: --
Garage: Basement
Fireplace: Yes
Zestimate : $770,718
Show all Home Facts
310
330
340

FIG. 3

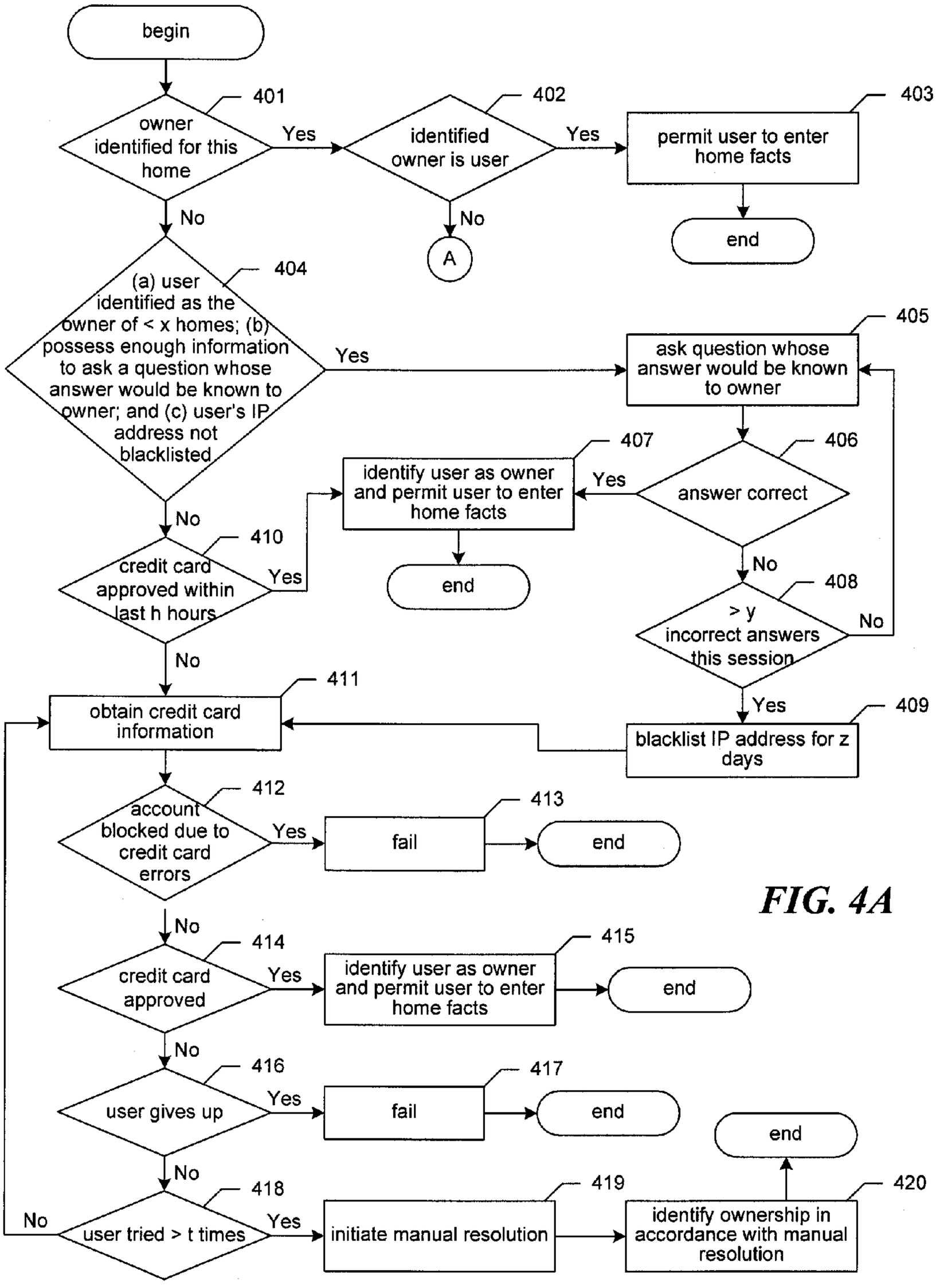

begin
401
owner identified for this home
Yes
402
identified owner is user
Yes
403
permit user to enter home facts
end
No
No
A
404
(a) user identified as the owner of < x homes; (b) possess enough information to ask a question whose answer would be known to owner; and (c) user's IP address not blacklisted
Yes
405
ask question whose answer would be known to owner
406
answer correct
Yes
407
identify user as owner and permit user to enter home facts
end
No
410
credit card approved within last h hours
Yes
No
408
> y incorrect answers this session
No
Yes
409
blacklist IP address for z days
411
obtain credit card information
412
account blocked due to credit card errors
Yes
413
fail
end
No
414
credit card approved
Yes
415
identify user as owner and permit user to enter home facts
end
No
416
user gives up
Yes
417
fail
end
No
418
user tried > t times
Yes
No
419
initiate manual resolution
420
identify ownership in accordance with manual resolution
end

FIG. 4A

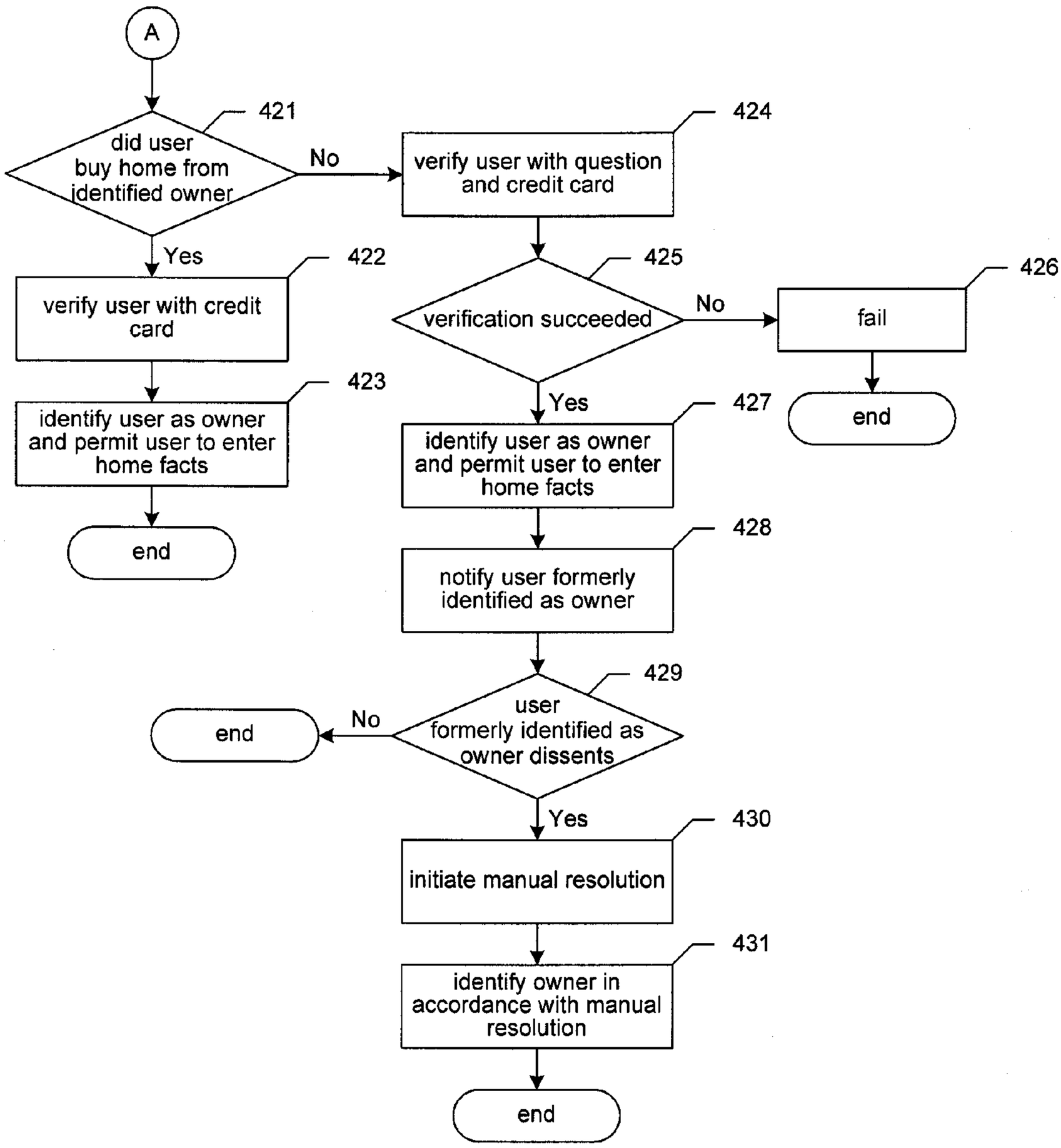

A
421
did user buy home from identified owner
No
424
verify user with question and credit card
Yes
422
verify user with credit card
425
verification succeeded
No
426
fail
end
423
identify user as owner and permit user to enter home facts
Yes
427
identify user as owner and permit user to enter home facts
end
428
notify user formerly identified as owner
429
user formerly identified as owner dissents
No
end
Yes
430
initiate manual resolution
431
identify owner in accordance with manual resolution
end

FIG. 4B

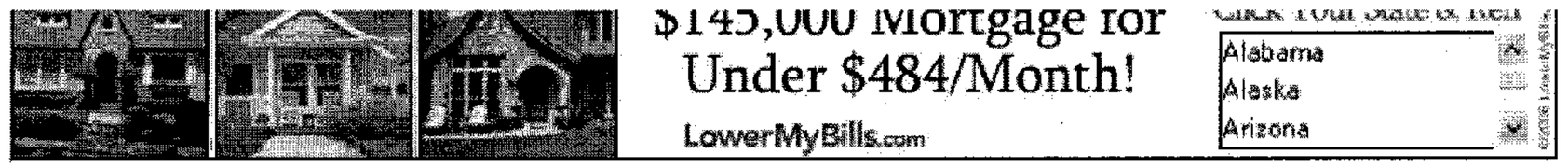

$145,000 Mortgage for
Under $484/Month!
LowerMyBills.com
Alabama
Alaska
Arizona
Zillow.com Beta
Your Edge in Real Estate
Welcome susan54! Here's your stuff: Favorite Homes (Not susan54? Click here.)
Home
Map & Search
My Zillow
How to Use Zillow
Value Any Home
Address OR Street OR Neighborhood City, State OR ZIP
126 16th ave e.
seattle, wa
GO Advanced Search
Confirm Ownership to Edit Home Facts
1234 Holly Ave, Seattle, WA 98122
Find Your Name
Before you can edit home facts, we need to make sure you are the legal owner of this home. Please select your name from the randomly generated list in the dropdown box below.
Select Home's Legal Owner
510
530
*I hereby confirm that I am the owner of this home and that I accept the rules set forth in Zillow.com's Terms of Use.
540
Continue
*= required
500
About Zillow.com: About Us | Questions | Press Room | Jobs | Give Feedback | Get Updates | Local Real Estate | Blog | Labs
Partner with us: Real Estate Professionals | Advertise With Us | Link to Us
Legal: Terms of Use | Privacy Policy | Accessibility
© 2006 Zillow.com, All Rights Reserved

FIG. 5

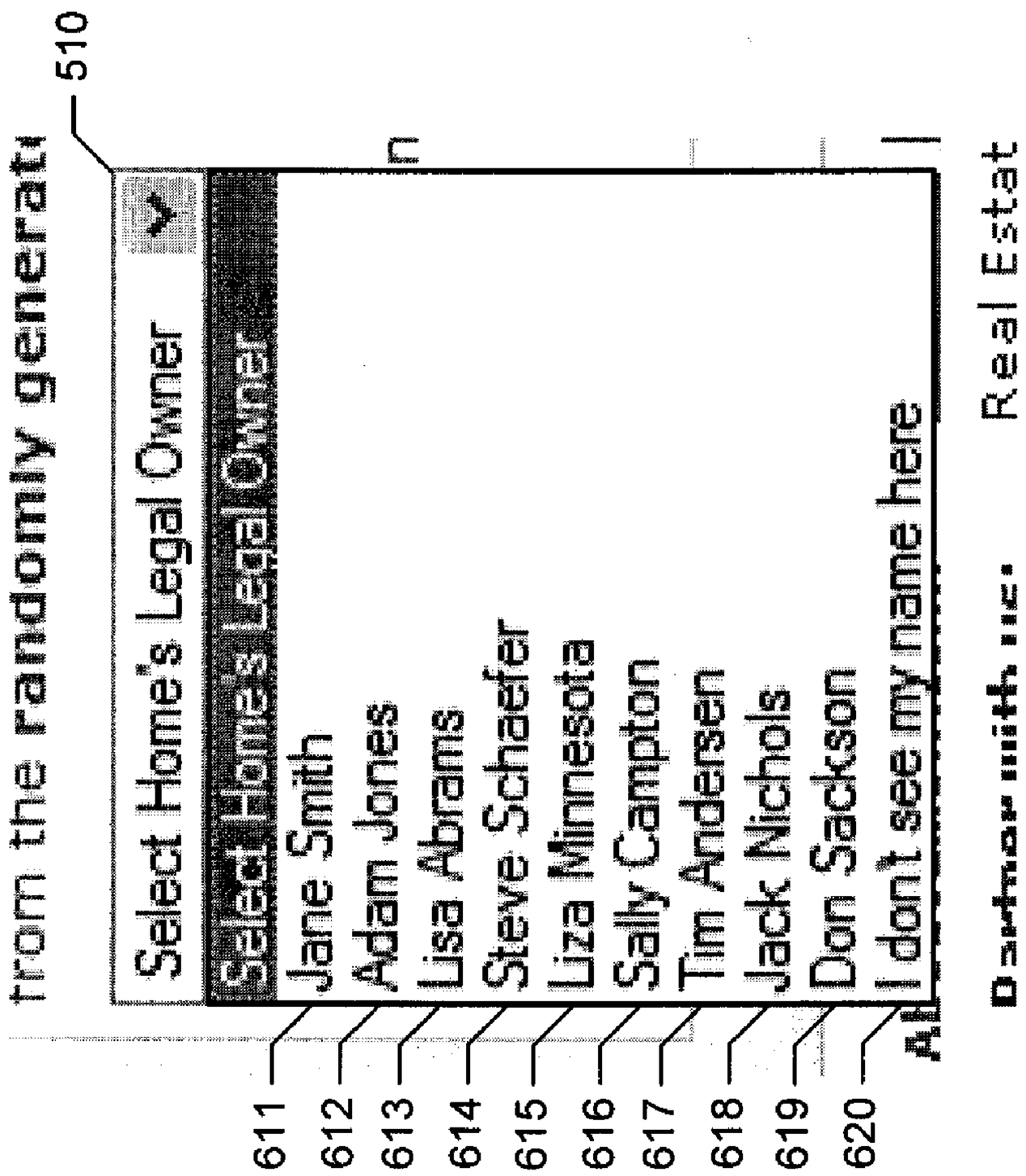

610
trom the randomly generat
Select Home's Legal Owner
Select Home's Legal Owner
Jane Smith
Adam Jones
Lisa Abrams
Steve Schaefer
Liza Minnesota
Sally Campton
Tim Andersen
Jack Nichols
Don Sackson
I don't see my name here
611
612
613
614
615
616
617
618
619
620
Real Estat

FIG. 6

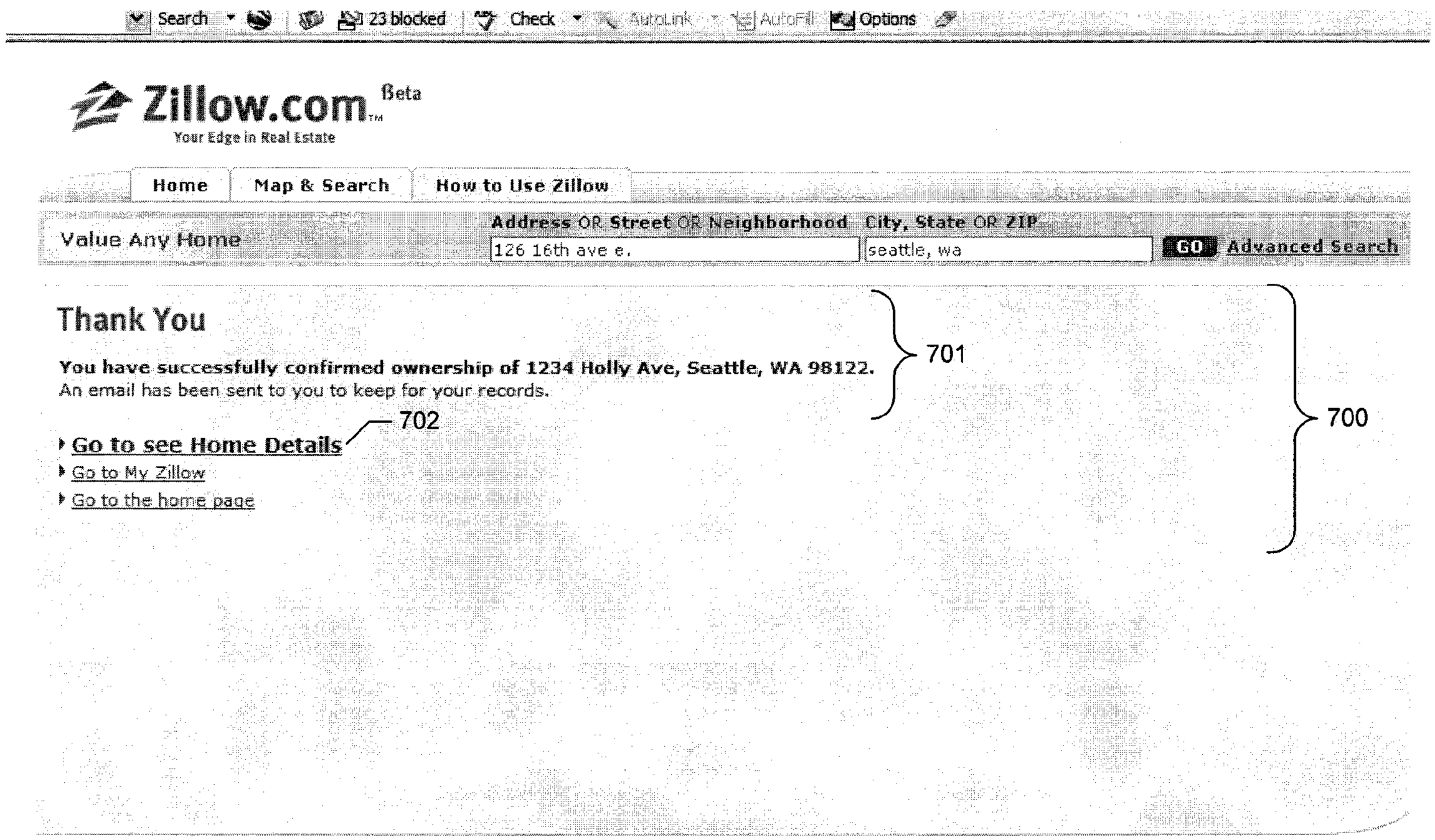

Search
23 blocked
Check
AutoLink
AutoFill
Options
Zillow.com Beta
Your Edge in Real Estate
Home
Map & Search
How to Use Zillow
Value Any Home
Address OR Street OR Neighborhood City, State OR ZIP
126 16th ave e.
seattle, wa
GO
Advanced Search
Thank You
You have successfully confirmed ownership of 1234 Holly Ave, Seattle, WA 98122.
An email has been sent to you to keep for your records.
701
700
Go to see Home Details
702
Go to My Zillow
Go to the home page
About Zillow.com: About Us | Questions | Press Room | Jobs | Give Feedback | Get Updates | Local Real Estate | Blog | Labs
Partner with us: Real Estate Professionals | Advertise With Us | Link to Us
Legal: Terms of Use | Privacy Policy | Accessibility
© 2006 Zillow.com, All Rights Reserved

FIG. 7

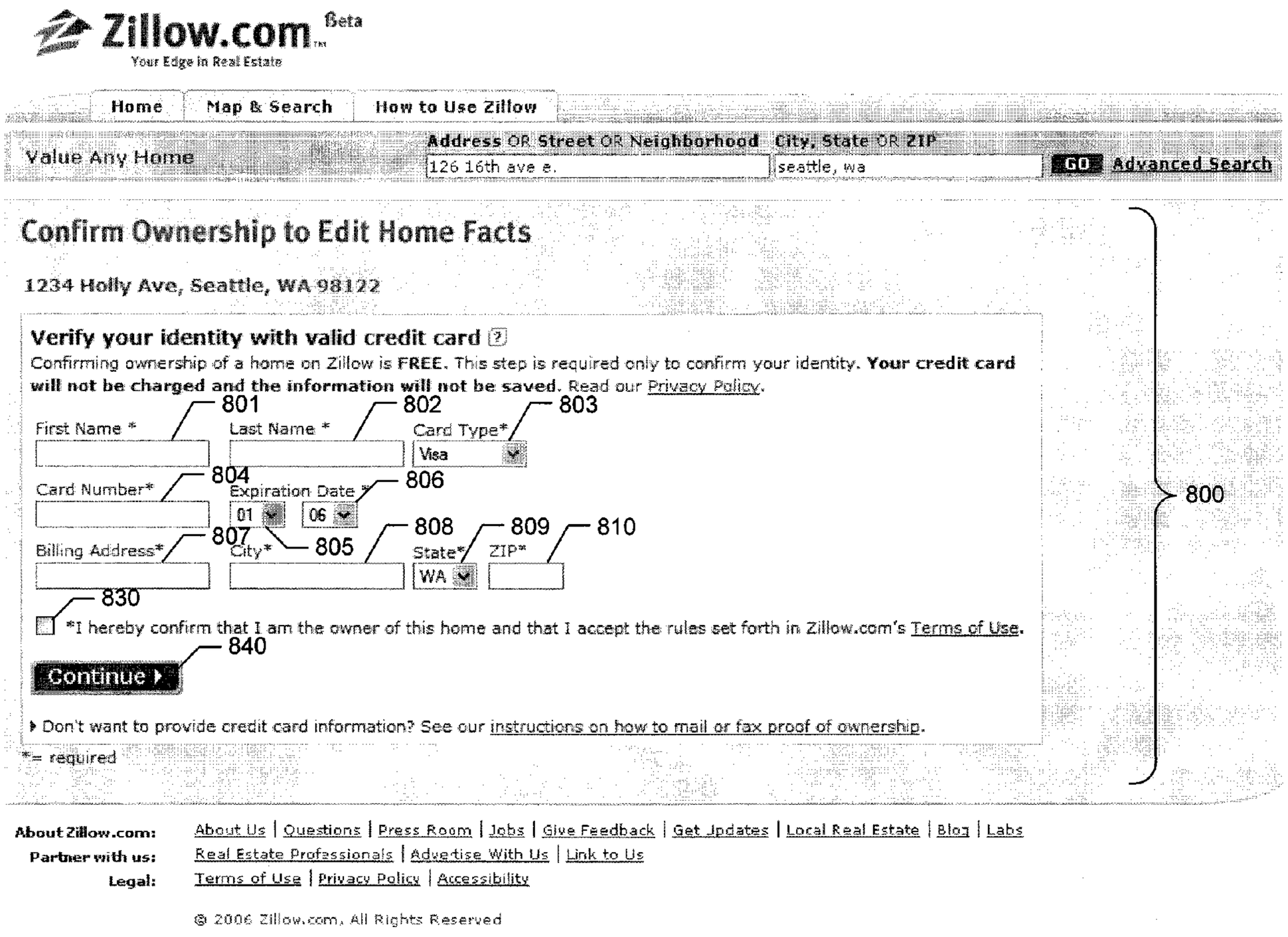

Zillow.com Beta
Your Edge in Real Estate
Home
Map & Search
How to Use Zillow
Value Any Home
Address OR Street OR Neighborhood
City, State OR ZIP
126 16th ave e.
seattle, wa
GO
Advanced Search
Confirm Ownership to Edit Home Facts
1234 Holly Ave, Seattle, WA 98122
Verify your identity with valid credit card
Confirming ownership of a home on Zillow is FREE. This step is required only to confirm your identity. Your credit card will not be charged and the information will not be saved. Read our Privacy Policy.
801
802
803
First Name *
Last Name *
Card Type*
Visa
804
Card Number*
Expiration Date *
806
01
06
808
809
810
807
805
Billing Address*
City*
State*
ZIP*
WA
830
*I hereby confirm that I am the owner of this home and that I accept the rules set forth in Zillow.com's Terms of Use.
840
Continue
Don't want to provide credit card information? See our instructions on how to mail or fax proof of ownership.
*= required
800
About Zillow.com:
About Us | Questions | Press Room | Jobs | Give Feedback | Get Updates | Local Real Estate | Blog | Labs
Partner with us:
Real Estate Professionals | Advertise With Us | Link to Us
Legal:
Terms of Use | Privacy Policy | Accessibility
© 2006 Zillow.com, All Rights Reserved

FIG. 8

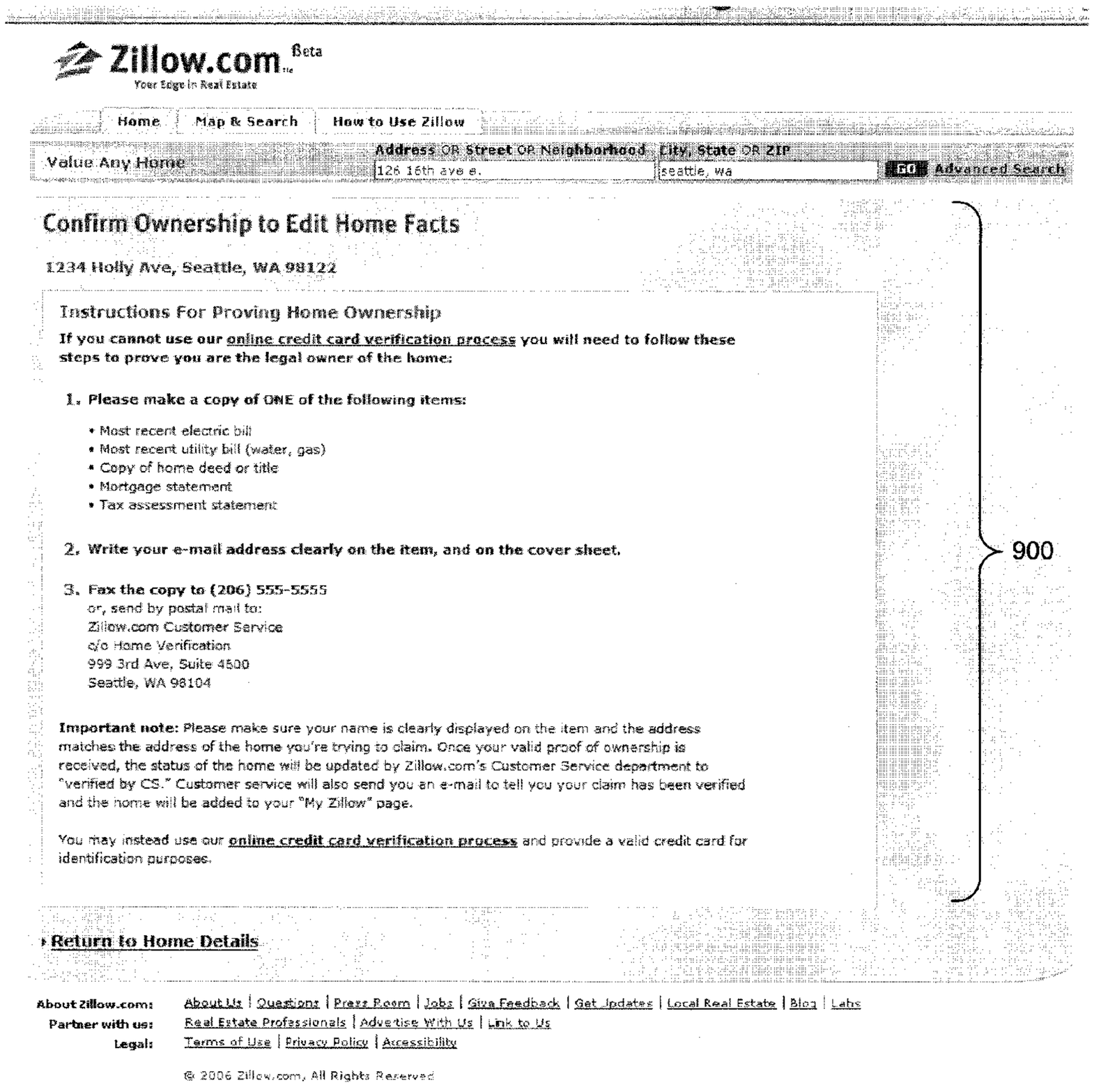

Zillow.com Beta
Your Edge in Real Estate
Home
Map & Search
How to Use Zillow
Value Any Home
Address OR Street OR Neighborhood
City, State OR ZIP
126 16th ave e.
seattle, wa
GO
Advanced Search
Confirm Ownership to Edit Home Facts
1234 Holly Ave, Seattle, WA 98122
Instructions For Proving Home Ownership
If you cannot use our online credit card verification process you will need to follow these steps to prove you are the legal owner of the home:
1. Please make a copy of ONE of the following items:
• Most recent electric bill
• Most recent utility bill (water, gas)
• Copy of home deed or title
• Mortgage statement
• Tax assessment statement
2. Write your e-mail address clearly on the item, and on the cover sheet.
3. Fax the copy to (206) 555-5555
or, send by postal mail to:
Zillow.com Customer Service
c/o Home Verification
999 3rd Ave, Suite 4500
Seattle, WA 98104
Important note: Please make sure your name is clearly displayed on the item and the address matches the address of the home you're trying to claim. Once your valid proof of ownership is received, the status of the home will be updated by Zillow.com's Customer Service department to "verified by CS." Customer service will also send you an e-mail to tell you your claim has been verified and the home will be added to your "My Zillow" page.
You may instead use our online credit card verification process and provide a valid credit card for identification purposes.
900
Return to Home Details
About Zillow.com: About Us | Questions | Press Room | Jobs | Give Feedback | Get Updates | Local Real Estate | Blog | Labs
Partner with us: Real Estate Professionals | Advertise With Us | Link to Us
Legal: Terms of Use | Privacy Policy | Accessibility
© 2006 Zillow.com, All Rights Reserved

FIG. 9

Zillow.com Beta
Your Edge in Real Estate

Home | Map & Search | How to Use Zillow

Value Any Home | Address OR Street OR Neighborhood: 126 16th ave e. | City, State OR ZIP: seattle, wa | GO | Advanced Search

This Home has a Confirmed Owner

Do you feel this is incorrect? Review these reasons and solutions:

1. **Recent purchase** – If you recently purchased this home, this transaction might not be in our system yet.
   Please confirm ownership via credit card. — 1001
2. **Two or more owners** – If you own this home with someone else, only one person can be listed as the confirmed owner of this home.
   Please login with co-owners id and password. — 1003
3. **Claimed in error** – It is possible that a person claimed this home accidentally or even intentionally.
   Please provide information to prove you are the rightful owner. — 1002

1000

About Zillow.com: About Us | Questions | Press Room | Jobs | Give Feedback | Get Updates | Local Real Estate | Blog | Labs
Partner with us: Real Estate Professionals | Advertise With Us | Link to Us
Legal: Terms of Use | Privacy Policy | Accessibility

© 2006 Zillow.com. All Rights Reserved

FIG. 10

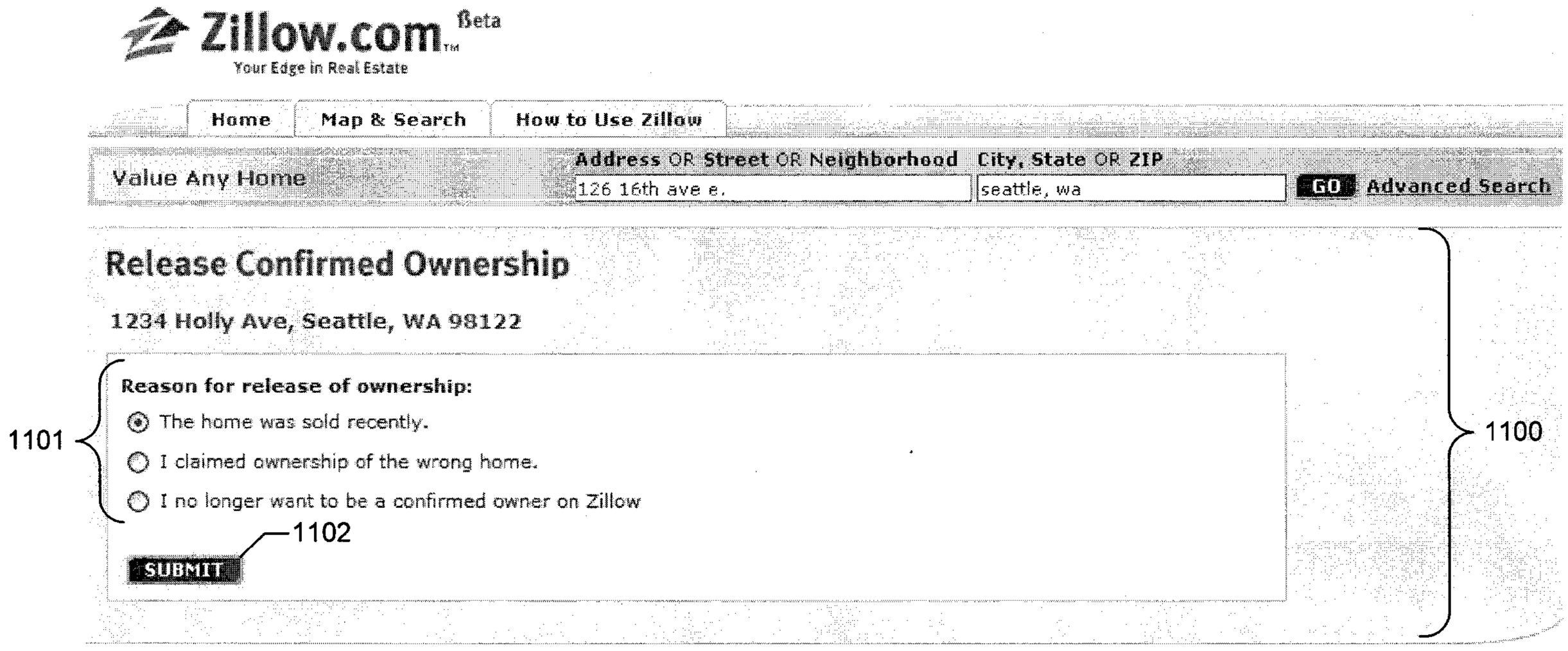

Zillow.com ßeta
Your Edge in Real Estate
Home
Map & Search
How to Use Zillow
Value Any Home
Address OR Street OR Neighborhood
126 16th ave e.
City, State OR ZIP
seattle, wa
GO
Advanced Search
Release Confirmed Ownership
1234 Holly Ave, Seattle, WA 98122
Reason for release of ownership:
The home was sold recently.
I claimed ownership of the wrong home.
I no longer want to be a confirmed owner on Zillow
1101
1102
SUBMIT
1100
About Zillow.com:
About Us | Questions | Press Room | Jobs | Give Feedback | Get Updates | Local Real Estate | Blog | Labs
Partner with us:
Real Estate Professionals | Advertise With Us | Link to Us
Legal:
Terms of Use | Privacy Policy | Accessibility
© 2006 Zillow.com, All Rights Reserved

FIG. 11

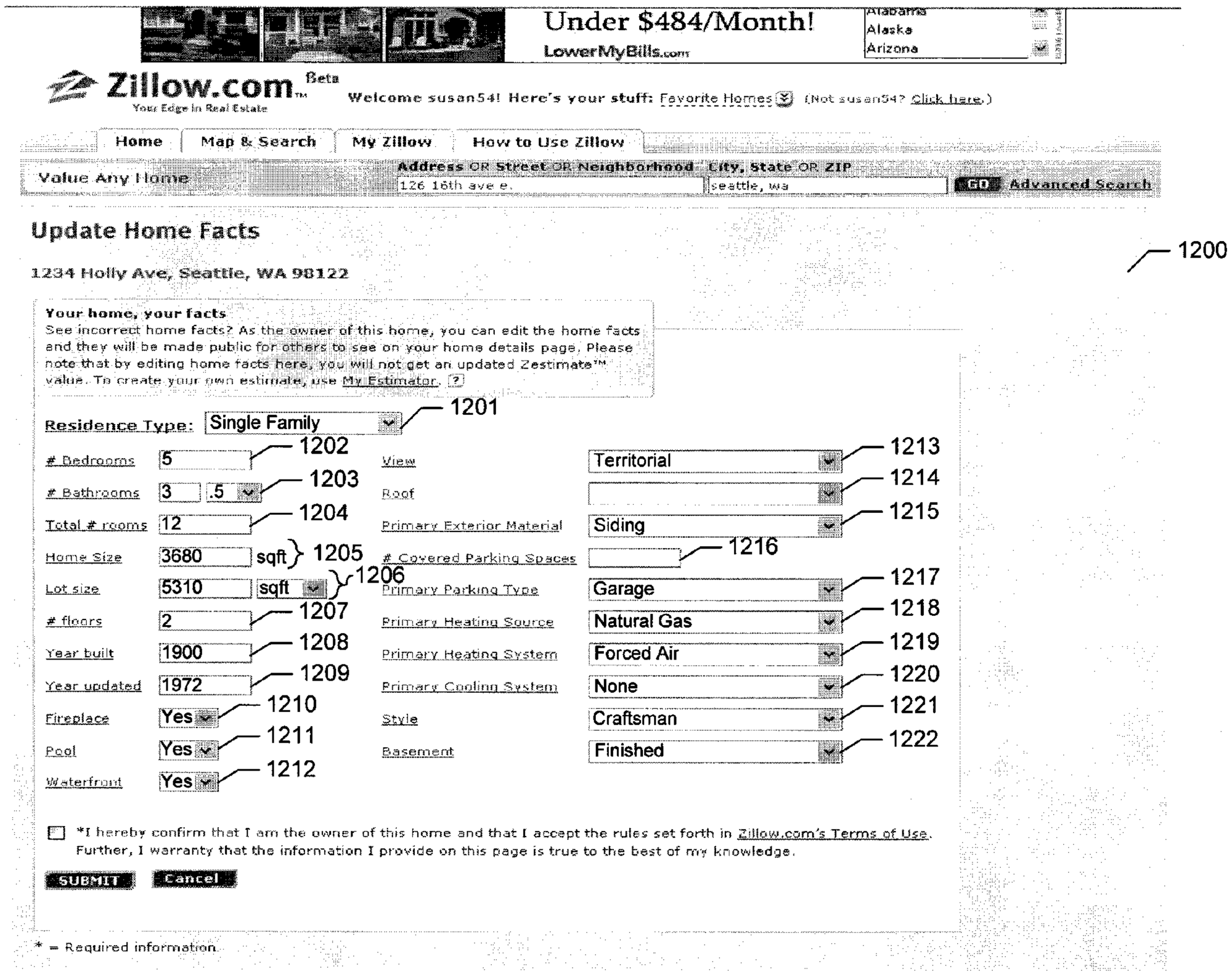

Under $484/Month!
LowerMyBills.com
Alabama
Alaska
Arizona
Zillow.com Beta
Your Edge in Real Estate
Welcome susan54! Here's your stuff: Favorite Homes (Not susan54? Click here.)
Home
Map & Search
My Zillow
How to Use Zillow
Value Any Home
Address OR Street OR Neighborhood
City, State OR ZIP
126 16th ave e
seattle, wa
GO
Advanced Search
Update Home Facts
1234 Holly Ave, Seattle, WA 98122
1200
Your home, your facts
See incorrect home facts? As the owner of this home, you can edit the home facts and they will be made public for others to see on your home details page. Please note that by editing home facts here, you will not get an updated Zestimate™ value. To create your own estimate, use My Estimator. ?
Residence Type: Single Family 1201
Bedrooms 5 1202
Bathrooms 3 .5 1203
Total # rooms 12 1204
Home Size 3680 sqft 1205
Lot size 5310 sqft 1206
floors 2 1207
Year built 1900 1208
Year updated 1972 1209
Fireplace Yes 1210
Pool Yes 1211
Waterfront Yes 1212
View Territorial 1213
Roof 1214
Primary Exterior Material Siding 1215
Covered Parking Spaces 1216
Primary Parking Type Garage 1217
Primary Heating Source Natural Gas 1218
Primary Heating System Forced Air 1219
Primary Cooling System None 1220
Style Craftsman 1221
Basement Finished 1222
*I hereby confirm that I am the owner of this home and that I accept the rules set forth in Zillow.com's Terms of Use. Further, I warranty that the information I provide on this page is true to the best of my knowledge.
SUBMIT
Cancel
* = Required information

FIG. 12

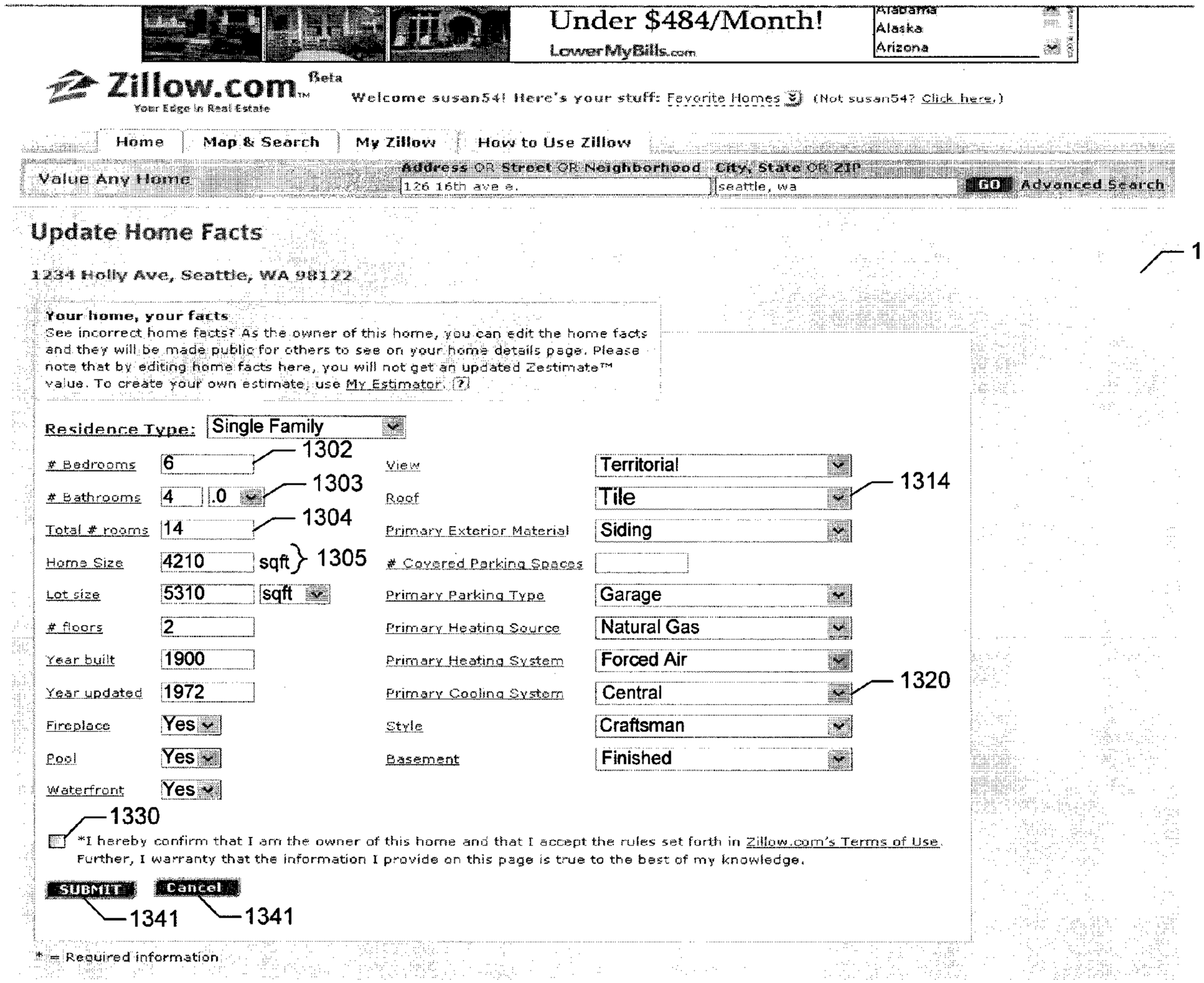

Under $484/Month!
LowerMyBills.com
Alabama
Alaska
Arizona
Zillow.com Beta
Your Edge in Real Estate
Welcome susan54! Here's your stuff: Favorite Homes (Not susan54? Click here.)
Home
Map & Search
My Zillow
How to Use Zillow
Value Any Home
Address OR Street OR Neighborhood
City, State OR ZIP
126 16th ave e.
seattle, wa
GO
Advanced Search
Update Home Facts
1300
1234 Holly Ave, Seattle, WA 98122
Your home, your facts
See incorrect home facts? As the owner of this home, you can edit the home facts and they will be made public for others to see on your home details page. Please note that by editing home facts here, you will not get an updated Zestimate™ value. To create your own estimate, use My Estimator.
Residence Type: Single Family
Bedrooms 6
1302
Bathrooms 4 .0
1303
Total # rooms 14
1304
Home Size 4210 sqft
1305
Lot size 5310 sqft
floors 2
Year built 1900
Year updated 1972
Fireplace Yes
Pool Yes
Waterfront Yes
View Territorial
Roof Tile
1314
Primary Exterior Material Siding
Covered Parking Spaces
Primary Parking Type Garage
Primary Heating Source Natural Gas
Primary Heating System Forced Air
Primary Cooling System Central
1320
Style Craftsman
Basement Finished
1330
*I hereby confirm that I am the owner of this home and that I accept the rules set forth in Zillow.com's Terms of Use. Further, I warranty that the information I provide on this page is true to the best of my knowledge.
SUBMIT
Cancel
1341
1341
* = Required information

FIG. 13

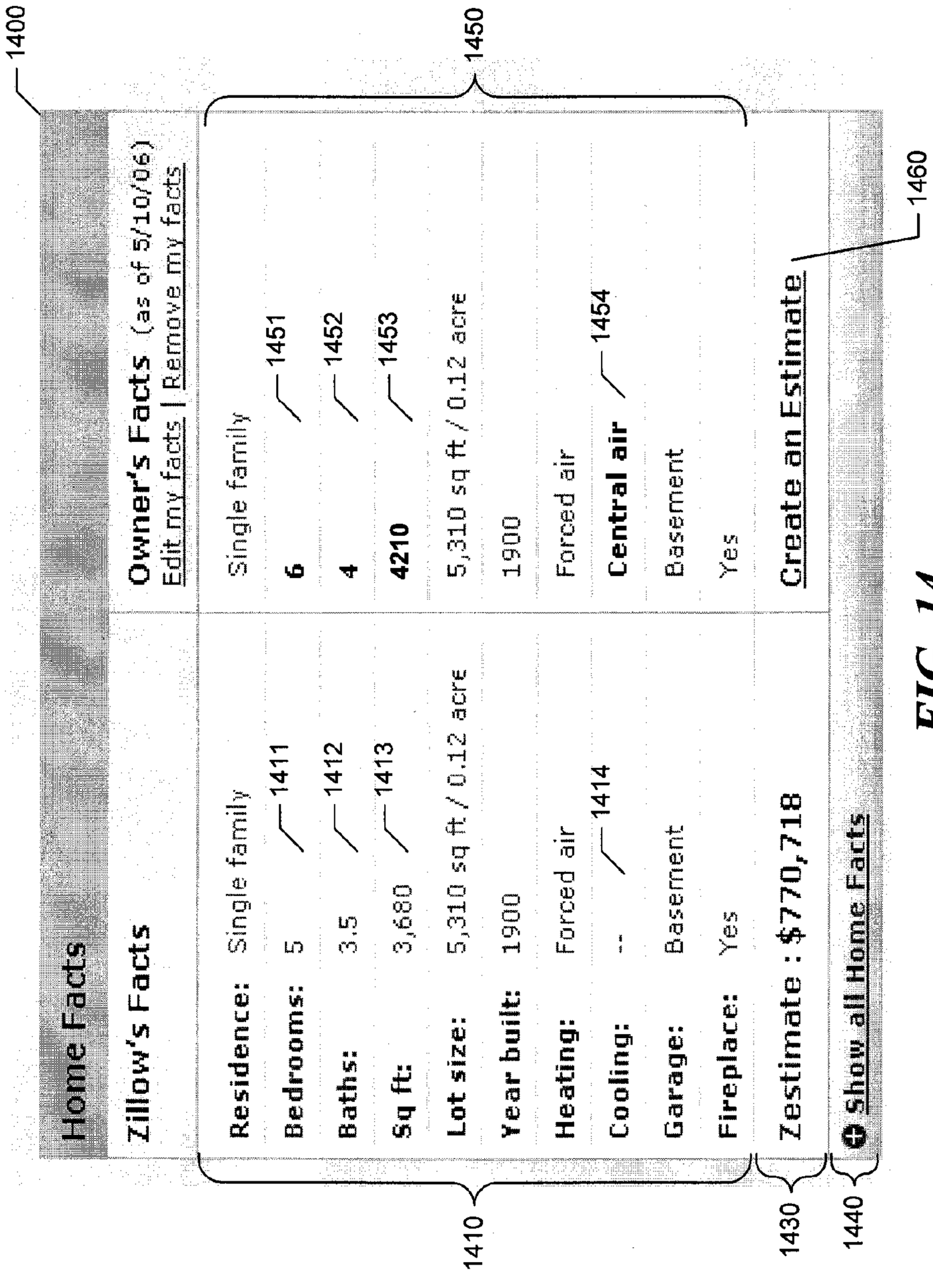

1400
1450
1460
Owner's Facts (as of 5/10/06)
Edit my facts | Remove my facts
Single family
6
4
4210
5,310 sq ft / 0.12 acre
1900
Forced air
Central air
Basement
Yes
Create an Estimate
1411
1412
1413
1414
1451
1452
1453
1454
Home Facts
Zillow's Facts
Residence:
Bedrooms:
Baths:
Sq ft:
Lot size:
Year built:
Heating:
Cooling:
Garage:
Fireplace:
Zestimate : $770,718
Show all Home Facts
1410
1430
1440

FIG. 14

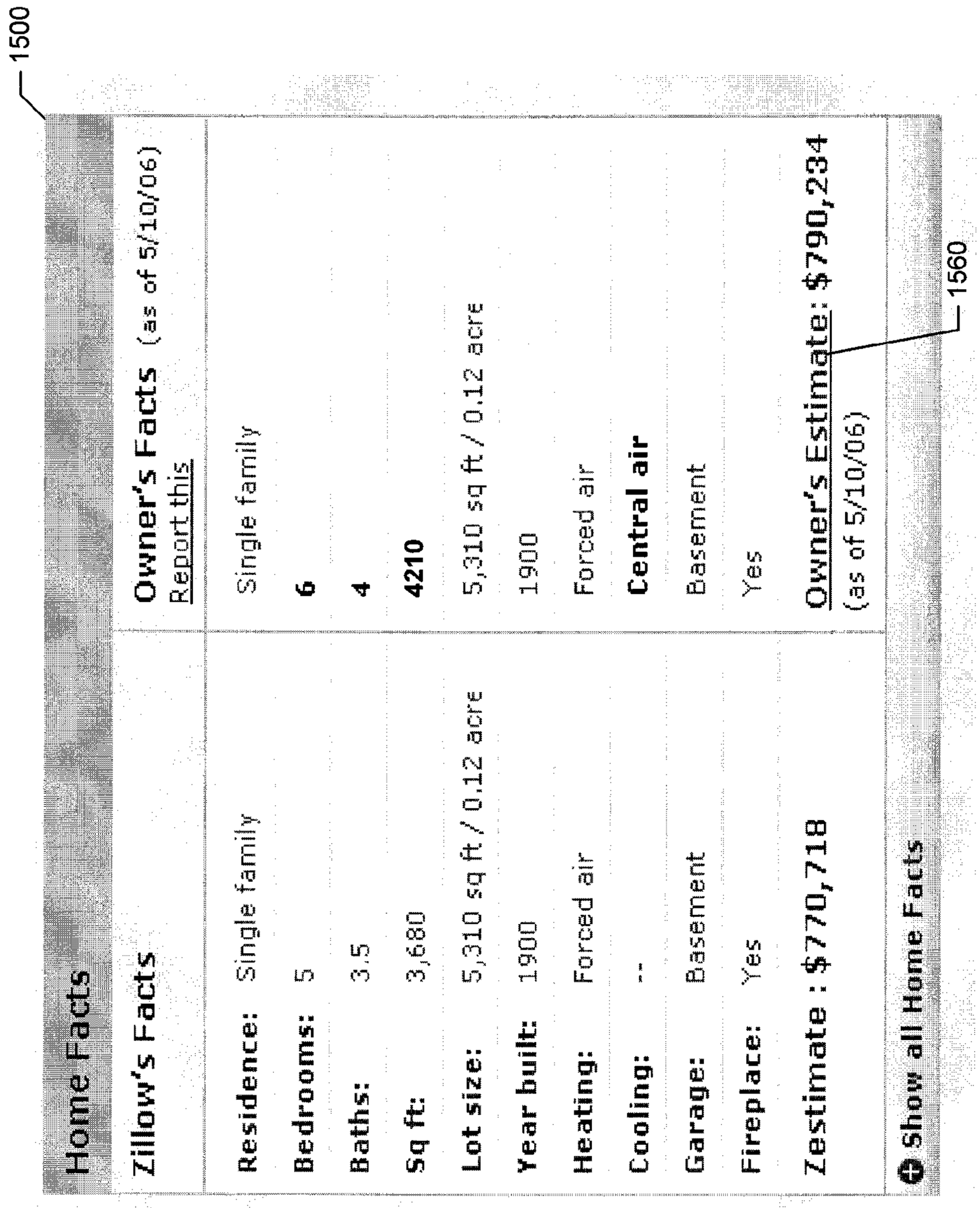

1500
Owner's Facts (as of 5/10/06)
Report this
Single family
6
4
4210
5,310 sq ft / 0.12 acre
1900
Forced air
Central air
Basement
Yes
Owner's Estimate: $790,234
(as of 5/10/06)
1560
Home Facts
Zillow's Facts
Residence: Single family
Bedrooms: 5
Baths: 3.5
Sq ft: 3,680
Lot size: 5,310 sq ft / 0.12 acre
Year built: 1900
Heating: Forced air
Cooling: --
Garage: Basement
Fireplace: Yes
Zestimate: $770,718
Show all Home Facts

FIG. 15

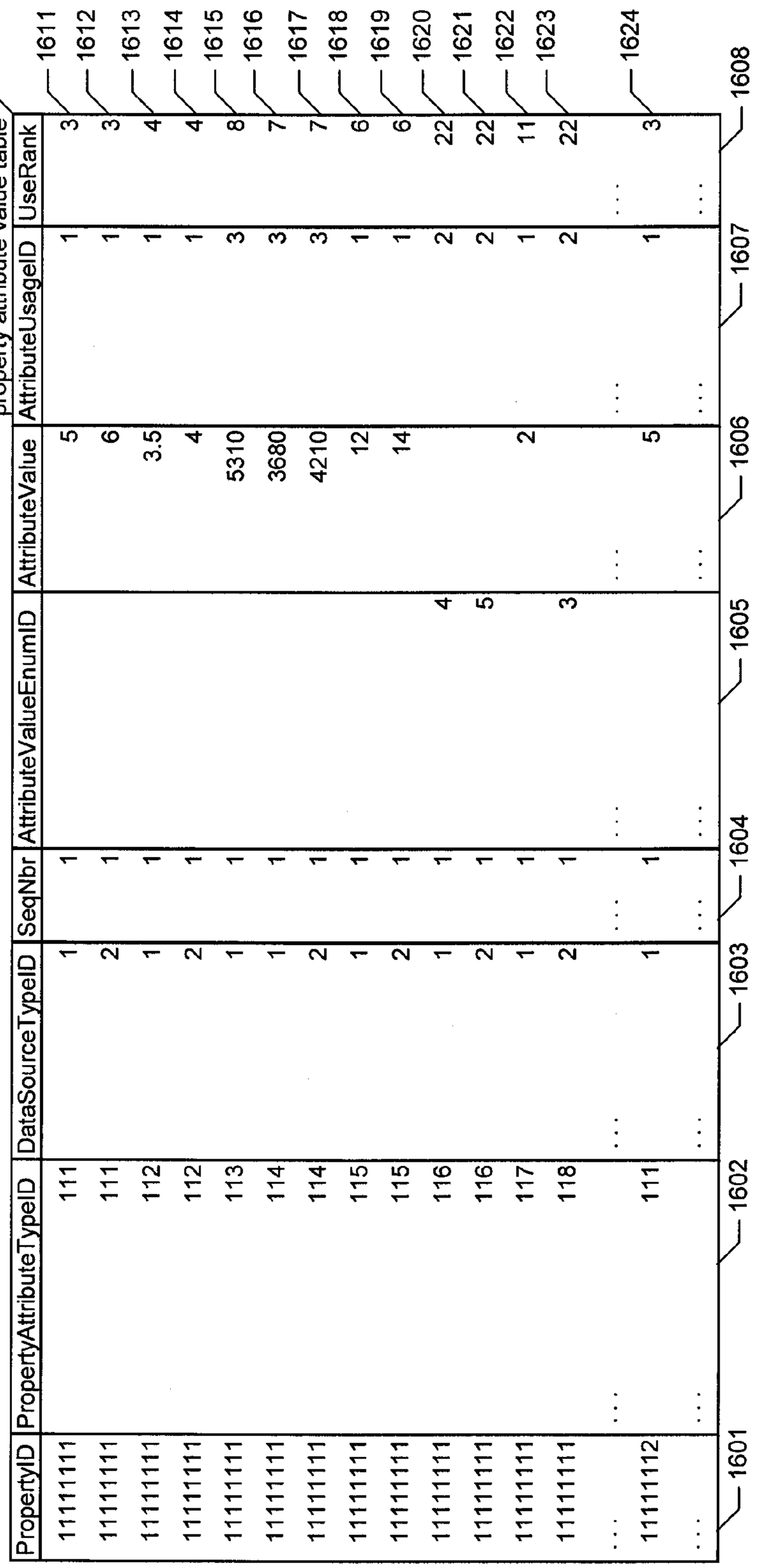

1600
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1608
1607
1606
1605
1604
1603
1602
1601
property attribute value table
PropertyID
PropertyAttributeTypeID
DataSourceTypeID
SeqNbr
AttributeValueEnumID
AttributeValue
AttributeUsageID
UseRank

FIG. 16

property table 1700

property ID	address	county	city	state	zip
11111111	1234 Holly Ave.	King	Seattle	WA	98122
11111112	567 Oak Ln.	King	Seattle	WA	98122

1701 1702 1703 1704 1705 1706 1711 1712

FIG. 17

property attribute type table 1800

PropertyAttributeTypeID	PropertyAttributeTypeDesc
111	number of bedrooms
112	number of bathrooms
113	lot size
114	home size
115	total number of rooms
116	cooling
117	number of floors
118	roof type
...	...

1801 1802 1811 1812 1813 1814 1815 1816 1817 1818

FIG. 18

data source type table 1900

DataSourceTypeID	DataSourceTypeDesc
1	local government
2	current owner

1901 1902 1911 1912

FIG. 19

attribute value enum table 2000

AttributeValueEnumID	PropertyAttributeTypeID	AttributeValueEnumDesc
1	111	composite
2	111	cedar shake
3	111	clay tile
4	116	none
5	116	central
6	116	window
7	116	in-floor

2001 2002 2003 2011 2012 2013 2014 2015 2016 2017

FIG. 20

attribute usage table (2100)

AttributeUsageID	AttributeUsageDescription
1	whole number
2	enumerated
3	decimal

(2101)

AttributeDataTypeID	AttributeUnitTypeID
integer	square feet
enum	
real	

(2102, 2103, 2104; 2111, 2112, 2113)

FIG. 21

property attribute type table (2200)

PropertyAttributeTypeID	PropertyAttributeTypeDesc
111	number of bedrooms
112	number of bathrooms
113	lot size
114	home size
115	total number of rooms
116	cooling
117	number of floors
118	roof type
...	...
140	school district
...	...

(2201, 2202; 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219)

FIG. 22

data source type table (2400)

DataSourceTypeID	DataSourceTypeDesc
1	local government
2	current owner
3	verified agent

(2401, 2402; 2411, 2412, 2413)

FIG. 24

property attribute value table 2300

PropertyID	PropertyAttributeTypeID	DataSourceTypeID	SeqNbr	AttributeValueEnumID	AttributeValue	AttributeValueRank	UseRank
11111111	111	1	1		5	3	1
11111111	111	2	1		6	3	1
11111111	112	1	1		3.5	4	1
11111111	112	2	1		4	4	1
11111111	113	1	1		5310	8	3
11111111	114	1	1		3680	7	3
11111111	114	2	1		4210	7	3
11111111	115	1	1		12	6	1
11111111	115	2	1		14	6	1
11111111	116	1	1	4		22	2
11111111	116	2	1	5	2	22	2
11111111	117	1	1			11	1
11111111	118	2	1	3		22	2
...	...	...	...	...	...	...	...
11111111	140	2	1		203	63	1
11111112	111	1	1		5	3	1
...	...	...	...	...	...	...	...

2301 2302 2303 2304 2305 2306 2307 2308

2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2325 2324

FIG. 23

property attribute value table

PropertyID	PropertyAttributeTypeID	DataSourceTypeID	SeqNbr	AttributeValueEnumID	AttributeValue	AttributeUsageID	UseRank
11111111	111	1	1		5	1	3
11111111	111	2	1		6	1	3
11111111	112	1	1		3.5	1	4
11111111	112	2	1		4	1	4
11111111	113	1	1		5310	3	8
11111111	113	3	1		5350	3	8
11111111	114	1	1		3680	3	7
11111111	114	2	1		4210	3	7
11111111	115	1	1		12	1	6
11111111	115	2	1		14	1	6
11111111	116	1	1	4		2	22
11111111	116	2	1	5		2	22
11111111	117	1	1	3	2	1	11
11111111	118	2	1			2	22
...	...	...	...	...	...	...	...
11111111	140	2	1		203	1	63
11111112	111	1	1		5	1	3
...	...	...	...	...	...	...	...

2500 2501 2502 2503 2504 2505 2506 2507 2508 2511 2512 2513 2514 2515 2526 2516 2517 2518 2519 2520 2521 2522 2523 2525 2524

FIG. 25

COLLECTING AND REPRESENTING HOME ATTRIBUTES

TECHNICAL FIELD

[0001] The described technology is directed to the fields of information gathering and representation.

BACKGROUND

[0002] It can be useful to have information about the attributes of one or more properties, such as one or more residential properties. Typical examples of such "home facts" include lot size, number of bedrooms, number of bathrooms, total floor space, view type, and roof type. By obtaining home facts for a home of interest, a person can arrive at a better sense of the home and its level of suitability to particular buyers.

[0003] In many cases, information about at least some home facts of a particular home is compiled by a governmental agency, such as the assessor's office for the county in which the home is located. Such information may be available directly from the governmental agency, and/or an intermediary information provider.

[0004] Unfortunately, information about home facts obtained in this way is frequently incomplete, in that it may cover only a few of a longer list of home facts that are of interest. Additionally, information about home facts obtained in this way is often out of date, or otherwise inaccurate. These deficiencies, typical of home facts information derived from common sources, tend to limit the value of presently-available home facts information.

[0005] Accordingly, an approach capable of acquiring, storing, and using a more complete and accurate set of home facts for a particular house than is available from government sources would have significant utility.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. **1** is a high-level data flow diagram showing data flow within a typical arrangement of components used to provide the facility.

[0007] FIG. **2** is a block diagram showing some of the components typically incorporated in at least some of the computer systems and other devices on which the facility executes.

[0008] FIG. **3** is a display diagram showing a sample display typically presented by the facility before the owner for a particular home has inputted home facts—i.e., attribute values—for a particular home.

[0009] FIGS. **4A-4B** contain a flow diagram showing steps typically performed by the facility in order to determine whether to identify a particular user as the owner of a particular home, and subsequently permit that user to provide attribute values for that home that are stored in the home facts database.

[0010] FIGS. **5** and **6** are display diagrams showing a sample display presented by the facility to ask a question of the user.

[0011] FIG. **7** is a display diagram showing a typical display presented by the facility when the user has been identified as the owner of the home.

[0012] FIG. **8** is a display diagram showing a typical display presented by the facility in order to obtain credit card information from the user.

[0013] FIG. **9** is a display diagram showing a display typically presented by the facility in connection with the manual resolution process.

[0014] FIG. **10** is a display diagram showing a typical display presented by the facility in order to determine whether the user purchased the home from the owner presently identified for the home.

[0015] FIG. **11** is a display diagram showing a sample display presented by the facility that permits a user who is currently identified as the owner of the home to relinquish confirmed ownership of the home.

[0016] FIG. **12** is a display diagram showing an initial version of a display usable by a user identified as the owner of the home to provide attribute values for the home.

[0017] FIG. **13** is a display diagram showing the second version of the display shown in FIG. **12**.

[0018] FIG. **14** is a display diagram showing a sample display presented by the facility in response to receiving home facts from the user identified as the owner of the home.

[0019] FIG. **15** is a display diagram showing a sample display presented by the facility containing a valuation of the home generated at least in part based upon the attribute values provided by the owner.

[0020] FIG. **16** is a table diagram showing sample contents of the property attribute value table.

[0021] FIG. **17** is a table diagram showing sample contents of the property table in the first state of the home facts database.

[0022] FIG. **18** is a table diagram showing sample contents of the property attribute type table in the first state of the home facts database.

[0023] FIG. **19** is a table diagram showing sample contents of the data source type table in the first state of the home facts database.

[0024] FIG. **20** is a table diagram showing sample contents of the attribute value enum table in the first state of the home facts database.

[0025] FIG. **21** is a table diagram showing sample contents of the attribute usage table in a first state of the home facts database.

[0026] FIG. **22** is a table diagram showing sample contents of the property attribute type table in the second state of the home facts database.

[0027] FIG. **23** is a table diagram showing several contents of the property attribute value table in the second state of the home facts database.

[0028] FIG. **24** is a table diagram showing sample contents of the data source type table in the third state of the home facts database.

[0029] FIG. **25** is a table diagram showing sample contents of the property attribute value table **2500** in the third state of the home facts database.

DETAILED DESCRIPTION

[0030] A software facility for managing information about home facts ("the facility") is described. The facility takes advantage of an extensible storage architecture for home facts information, which can be easily expanded to accommodate new home facts or updated ranges of values for existing home facts. In some embodiments, the storage architecture simultaneously stores home facts information from multiple sources about the same home, such as home facts information from a government agency, home facts obtained from a user identified as the owner of the home, and

home facts obtained from a user identified as having some other role with respect to the home, such as a former owner, an appraiser charged with appraising the house, or a listing agent who is undertaking to sell the house.

[0031] In some embodiments, the facility provides a user interface that the owner of a home or another user knowledgeable about the home can use to correct information provided for the home by another source; confirm information provided for the home by another source; or provide information about the home not available from another source. The home facts information provided using the user interface can include various types of data, such as numerical values, text, items selected from enumerated lists, photos or videos of the home, documents relating to the home such as appraisals or inspection reports, etc.

[0032] In some embodiments, the facility displays together home facts information about a particular home from multiple sources, or otherwise uses home facts information about a particular home from multiple sources. In some embodiments, the facility employs logic for combining home facts information from multiple sources to obtain composite home facts information for a home whose completeness and/or accuracy may exceed those of home facts information from a government agency. As useful home facts information for a home becomes available from additional sources, the quality of the composite home facts obtained for the home using the combination logic may continue to increase.

[0033] In some embodiments, the facility employs one or more approaches to identifying the current owner of a home, so as to limit the ability of non-owners to inaccurately identify themselves as owners and submit unreliable home facts.

[0034] FIG. **1** is a high-level data flow diagram showing data flow within a typical arrangement of components used to provide the facility. FIG. **1** shows a home facts database **101** in which the facility stores home facts information obtained from multiple sources, which is hosted by one or more database servers **100**. As examples, the home facts database contains home facts information **112** exploited from public information sources such as title recording offices, property tax assessment or collection agencies, or intermediaries providing access to such data, via the Internet **130** and a data importation server **140**. Additionally, the home facts database contains home facts **122** inputted by users identified as owners of the subject homes via the Internet and a web server **150**. All of the contents of the home facts database are potentially available for inclusion in web pages **162** generated by the facility containing information about particular houses or groups of houses and served to visitors **161**.

[0035] While various embodiments are described in terms of the environment described above, those skilled in the art will appreciate that the facility may be implemented in a variety of other environments including a single, monolithic computer system, as well as various other combinations of computer systems or similar devices connected in various ways. In various embodiments, a variety of computing systems or other different client devices may be used in place of the web client computer systems, such as mobile phones, personal digital assistants, televisions, cameras, etc.

[0036] FIG. **2** is a block diagram showing some of the components typically incorporated in at least some of the computer systems and other devices on which the facility executes. These computer systems and devices **200** may include one or more central processing units ("CPUs") **201** for executing computer programs; a computer memory **202** for storing programs and data while they are being used; a persistent storage device **203**, such as a hard drive for persistently storing programs and data; a computer-readable media drive **204**, such as a CD-ROM drive, for reading programs and data stored on a computer-readable medium; and a network connection **205** for connecting the computer system to other computer systems, such as via the Internet. While computer systems configured as described above are typically used to support the operation of the facility, those skilled in the art will appreciate that the facility may be implemented using devices of various types and configurations, and having various components.

[0037] In some embodiments, identified owners and/or visitors may use a variety of devices in order to input home facts or view home facts provided form the home facts database. These users may use desktop computers, laptop computers, wireless email devices, wireless phones, set top boxes, automobile computers, or other devices having a web browser to interact with web pages with respect to such information. Additionally, these users may use these or other types of devices to communicate directly or indirectly with the server in a variety of other modes, including via email, text message, voice message, live voice call, etc.

[0038] FIG. **3** is a display diagram showing a sample display typically presented by the facility before the owner for a particular home has inputted home facts—i.e., attribute values—for a particular home. The display **300** indicates attribute values **310** obtained from a source other than the owner, such as attribute values obtained from government sources. The display further shows a valuation **330** determined in accordance with these attribute values, and a control **340** that the user may activate to display all such attribute values. The display further includes an indication that attribute values have not yet been received for this home by the home's owner, and a control **349** that the user may activate in order to provide attribute values for the home.

[0039] While FIG. **3** in each of the display diagrams discussed below show particular display contents and organization, generally formatted as a web page or a portion of a web page, those skilled in the art will appreciate that actual displays used by the facility to present information may differ from those shown, in that they, for example, may contain different information, information that is portrayed differently, a different organization, a different format, etc.

[0040] In some embodiments, in response to the user's activation of control **349**, the facility performs a process to determine whether to identify the user as the owner of the current home. FIGS. **4**A-**4**B contain a flow diagram showing steps typically performed by the facility in order to determine whether to identify a particular user as the owner of a particular home, and subsequently permit that user to provide attribute values for that home that are stored in the home facts database. In step **401**, if an owner is presently identified for this home, then the facility continues in step **402**, else the facility continues in step **404**. In step **402**, if the identified owner is the current user, then the facility continues in step **403**, else the facility continues through connector A at step **421**, shown in FIG. **4**B. In step **403**, the facility permits the current user to provide and/or edit home facts as is discussed further below in connection with FIGS. **12**-**15**. After step **403**, these steps conclude.

[0041] In step **404**, if each of the following three conditions is true, then the facility continues in step **405**, else the facility continues in step **410**: the user is identified as the owner of fewer than X homes, such as one home; the facility possesses enough information to ask a question whose answer would be known to the owner of the home; and the IP address of the user's computer is not presently blacklisted. In step **405**, the facility asks a question of the user whose answer would be known to the owner of the home.

[0042] FIGS. **5** and **6** are display diagrams showing a sample display presented by the facility to ask a question of the user. Display **500** includes a control **510** usable by the user to answer the posed question, here the name of the home's legal owner. This control is shown expanded in FIG. **6**, with a list of names **611-616** that the user may select in response to the question, as well as alternative **620** indicating that the user's name is not among those displayed. In some embodiments, the name of the home's legal owner is randomly located within the order of names shown in the control, and/or randomly omitted from this list. In various embodiments, other types of questions whose answer is expected to be known by the home's owner are used in step **405**. After the user operates the control **510** to select the correct answer to the question, the user selects a checkbox **530** confirming that he or she is the owner of the home, and activates a continue control **540**.

[0043] Returning to FIG. **4**A, in step **406**, if the answer provided by the user to the question posed in step **405** is correct, then the facility continues in step **407**, else the facility continues in step **408**. In step **407**, the facility identifies the current user as the owner of the home, and permits this user to enter home facts as described below. After step **407**, these steps conclude.

[0044] FIG. **7** is a display diagram showing a typical display presented by the facility when the user has been identified as the owner of the home. The display **700** includes an indication **701** that the user has been identified as the owner of the home, and a control **702** that the user may activate in order to edit home details for the home. In some embodiments, rather than presenting the display shown in FIG. **7**, after step **407**, the facility immediately presents a display that enables the user to edit the home facts for the home, such as the display shown in FIG. **12**.

[0045] Returning to FIG. **4**A, in step **408**, if the user has provided more than a number Y of incorrect answers to the questions posed in step **405** during a particular foregoing period of time, such as the current web browsing session, then the facility continues in step **409**, else the facility continues in step **405** to ask another question whose answer would be known to the owner of the home. In step **409**, the facility blacklists the IP address of the user's computer for Z days, such as seven days, preventing this computer from being used to claim a home by answering questions posed in step **405** for this period of time. After step **409**, the facility continues in step **411**.

[0046] In step **410**, if this user has provided credit card information within the last H hours—such as the last one hour—that has subsequently been successfully verified, then the facility continues in step **407** to identify the user as the owner of the home, else the facility continues in step **411**. In step **411**, the facility obtains credit card information from the user.

[0047] FIG. **8** is a display diagram showing a typical display presented by the facility in order to obtain credit card information from the user. The display **800** contains controls **801-810** that may be used by the user to provide credit card information. The display further includes a checkbox **830** for the user to select in order to confirm that the user is the owner of the home. The display further includes a continued control **840** that the user may activate in order to submit the entered credit card information.

[0048] Returning to FIG. **4**A, in step **412**, if the user's account is blocked due to earlier credit card errors, then the facility continues in step **413**, else the facility continues in step **414**. In step **413**, the user's efforts to be identified as the owner of the home fail, and these steps conclude without identifying the user as the owner of the home. In step **414**, the credit card information obtained from the user in step **411** is verified, such as with the issuer of the credit card, a charge-clearing bureau associated with the credit card, or similar entity; if the credit card information is approved, then the facility continues in step **415**, else the facility continues in step **416**. In step **415**, the facility identifies the user as the owner of the home and permits the user to enter home facts. After step **415**, these steps conclude.

[0049] In step **416**, if the user gives up on attempting to be identified as the owner of the home, then the facility continues in step **417**, else the facility continues in step **418**. In step **417**, the user's efforts to be identified as the owner of the home fail, and these steps conclude without identifying the user as the owner of the home.

[0050] In step **418**, if the user has tried more than T times, such as two times, to be identified as the owner of the home based on credit card information, then the facility continues in step **419**, else the facility continues in step **411** to again obtain credit card information from the user.

[0051] In step **419**, as the user has not given up, the facility initiates a manual resolution process for determining whether the user is the owner of the home. As an example, the manual resolution process may require the user to provide documentary evidence that he or she is the owner of the home to the operator of the facility, such as via postal mail, email, or the uploading of an image of such documentary evidence. Such documentary evidence may include copies or images of such documents as: a deed, a title, a mortgage statement, a property tax assessment, a property tax bill, a recent utility bill, or another document identifying both the home and the user and reflecting ownership of the home by the user.

[0052] FIG. **9** is a display diagram showing a display typically presented by the facility in connection with the manual resolution process. It contains information **900** about the manual resolution process, including a sample list of acceptable documents.

[0053] Returning to FIG. **4**A, in step **420**, the facility identifies the ownership of the home in accordance with the result of the manual resolution process. In some embodiments, this involves identifying the user as the owner of the home if the user successfully completes the manual resolution process, and not identifying any owner for the home if the user does not successfully complete the manual resolution process. After step **420**, these steps conclude.

[0054] Turning to FIG. **4**B, in step **421**, if the user purchased the home from the person currently identified as the owner of the home, then the facility continues in step **422**, else the facility continues in step **424**.

[0055] FIG. **10** is a display diagram showing a typical display presented by the facility in order to determine

whether the user purchased the home from the owner presently identified for the home. The display **1000** includes a control **1001** that the user may operate in order to indicate that they recently purchased the home, and begin an appropriate process for confirming their ownership of the home. In some embodiments, the display also includes a control **1002** that the user may activate to indicate that the user currently identified as the owner of the home maliciously and erroneously requested to be identified as the owner of the home, and a control **1003** that the user may activate in order to indicate that the user co-owns the home with the person presently identified as the owner of the home.

[0056] Returning to FIG. **4**B, in step **422**, the facility verifies the user with credit card information in accordance with steps **411**, **412**, **414**, **416**, and **418**. In step **423**, if the verification of step **422** succeeded, the facility identifies the user as the owner of the home and permits the user to enter home facts. After step **423**, these steps conclude.

[0057] In step **424**, the facility verifies the user with both a question—in accordance with steps **405**, **406**, and **408**—and with credit card information—in accordance with steps **411**, **412**, **414**, **416**, and **418**. In step **425**, if both forms of verification performed in step **424** succeeded, then the facility continues in step **427**, else the facility continues in step **426**. In step **426**, the user's efforts to be identified as the owner of the home fail, and these steps conclude without identifying the user as the owner of the home.

[0058] In step **427**, the facility identifies the user as the owner of the home and permits the user to enter home facts for the home. In step **428**, the facility notifies the user formerly identified as the owner of the home. In step **429**, if the user formerly identified as the owner of the home dissents from the identification of the current user as the owner of the home, then the facility continues in step **430**, else these steps conclude.

[0059] In step **430**, the facility initiates a manual resolution process to determine which of the two users should be identified as the owner of the home. In some embodiments, this process is similar to the one described above in connection with step **419**, selecting the user that is able to successfully provide documentary evidence that he or she currently owns the home. In step **431**, the facility identifies the owner of the home in accordance with a manual resolution performed in step **430**. After step **431**, these steps conclude.

[0060] Those skilled in the art will appreciate that the steps shown in FIGS. **4**A-**4**B may be altered in a variety of ways. For example, the order of the steps may be rearranged; substeps may be performed in parallel; shown steps may be omitted, or other steps may be included; etc.

[0061] In some embodiments (not shown), the facility permits the user to initiate manual resolution in some or all of the circumstances in which FIGS. **4**A-**4**B show the user's attempt to be identified as the owner of the home failing, such as in step **413** and/or step **426**.

[0062] FIG. **11** is a display diagram showing a sample display presented by the facility that permits a user who is currently identified as the owner of the home to relinquish confirmed ownership of the home. Display **1100** includes a control **1101** that the user may operate in order to specify a reason for relinquishing ownership. The display further includes a submit control **1102** that the user may activate in order to relinquish ownership of the home.

[0063] FIGS. **12-15** show a sample user interface typically presented by the facility that enables a user identified as the owner of a home to edit or update home facts associated with the home, i.e., provide attribute values for the home. FIG. **12** is a display diagram showing an initial version of a display usable by a user identified as the owner of the home to provide attribute values for the home. The initial version **1200** of the display contains controls **1201-1222**, each corresponding to a different home attribute and showing a value for that attribute currently in the possession of the facility, such as a value obtained from a source other than the owner, such as a value obtained from a government source. For example, control **1202** indicates that the facility currently possesses a value of 5 for the number of bedrooms attribute.

[0064] FIG. **13** is a display diagram showing the second version of the display shown in FIG. **12**. This version of the display **1300** shows the display after the user has used some of the controls to provide new values of the associated attributes. In particular, the user has used controls **1302**, **1303**, **1304**, **1305**, **1314**, and **1320** to provide new values of the associated attributes. As one particular example, a user has used control **1302** to provide the value 6 for a number of bedrooms' attribute, for which the facility had earlier obtained the value of 5 from another source. These attribute values provided by the owner are consistent with a small addition that added 530 square feet and two rooms, including one bedroom and an expansion of a half bathroom, as well as central air conditioning. They also reflect that the home has a tile roof, a detail not present among the earlier-obtained attribute values. After using the controls to provide attribute values that differ from the ones initially shown, the user selects a checkbox **1330** again confirming that he or she is the owner of the home and promising that the home facts entered by the user are accurate, then activates a submit control **1341** to provide these attribute values. The user can instead activate a cancel control **1341** in order not to provide any attribute values for the home.

[0065] FIG. **14** is a display diagram showing a sample display presented by the facility in response to receiving home facts from the user identified as the owner of the home. The display **1400** is similar to display **300** shown in FIG. **4**, but contains the attribute values **1450** provided by the owner, including attribute values **1451**, **1452**, and **1454**, which differ from the attribute values provided for the same attributes by another source of attribute values, and are shown in bold to highlight this difference. Again, the user can select a control **1440** to display, for all of the home's attributes, the values provided by the owner and the other attribute value source. The display also contains a control **1460** that the user may activate in order to generate a valuation for the home based upon the attribute values provided by the owner, or some combination of the attribute values provided by the owner and attribute values obtained from one or more other sources.

[0066] FIG. **15** is a display diagram showing a sample display presented by the facility containing a valuation of the home generated at least in part based upon the attribute values provided by the owner. The display **1500** includes such a valuation **1560**. In some embodiments, the facility generates this valuation in accordance with one or more of U.S. patent application Ser. No. 11/347,000, filed on Feb. 3, 2006; U.S. patent application Ser. No. 11/347,024, filed on Feb. 3, 2006; and/or U.S. patent application Ser. No. _____

(patent counsel's matter no. 56920-8015-US00), filed concurrently herewith, each of which is hereby incorporated by reference in its entirety.

[0067] FIGS. **16-25** show sample contents of the home facts database maintained and used by the facility. In some embodiments, the home facts database stores home attribute values and associated information in six tables: a property attribute value table, a property table, a property attribute type table, a data source type table, an attribute value enum table, and an attribute usage table. FIGS. **16-21** show an initial state of the home facts database, while FIGS. **22-23** and **24-25** each correspond to subsequent states of the database.

[0068] FIG. **16** is a table diagram showing sample contents of the property attribute value table. The property attribute value table **1600** contains a row for each value for a particular house (i.e., property) for a particular attribute (i.e., home fact) obtained from a particular data source, such as rows **1611-1624** shown in the drawing. Each row is divided into the following columns: a PropertyID column **1601** containing a unique identifier for the home; a PropertyAttributeTypeID column **1602** containing a unique identifier identifying the particular attribute whose value is contained by the row; a DataSourceTypeID column **1603** containing a unique identifier for the source of the attribute value contained by the row; a SeqNbr column **1604** indicating the number of values for this home and attribute previously obtained from this data source; an AttributeValueEnumID column **1605** containing an identifier for the attribute value if the attribute value is of an enumerated type; an AttributeValue column **1606** containing a value for the attribute if the attribute is for a non-enumerated type; an AttributeUsageID column **1607** containing an identifier for a manner of interpreting the attribute value indicated by the row; and a UseRank column **1608** indicating where in a list of attribute values for the home the attribute value indicated by the current row should be displayed. Additional information about the home identified by the PropertyID column of a particular row can be found in the property table, linked by the PropertyID. Additional information about the identity of the attribute identified by the PropertyAttributeTypeID in a particular row may be found in the property attribute type table, linked by PropertyAttributeTypeID. Additional information about the DataSourceTypeID contained in a particular row may be found in the data source type table, linked by DataSourceTypeID. Additional information about the AttributeValueEnumID contained in a particular row may be found in the attribute value enum table, linked by the AttributeValueEnumID. Additional information about the AttributeUsageID contained by a particular row may be found in the attribute usage table, linked by AttributeUsageID.

[0069] While FIG. **16** and each of the table diagrams discussed below show a table whose contents and organization are designed to make them more comprehensible by a human reader, those skilled in the art will appreciate that actual data structures used by the facility to store this information may differ from the table shown, in that they, for example, may be organized in a different manner; may contain more or less information than shown; may be compressed and/or encrypted; etc.

[0070] FIG. **17** is a table diagram showing sample contents of the property table in the first state of the home facts database. The property table **1700** contains a row for each home for which attribute values are contained by the property attribute value table, such as rows **1711** and **1712**. Each row is divided into the following columns: a PropertyID column **1701** containing a property ID uniquely identifying the home; an address column **1702** containing an address for the home; a county column **1703** showing the county in which the home is located; a city column **1704** showing a city in which the home is located; a state column **1705** showing a state in which the home is located; and a zip column **1706** showing a zip code for the home. In various embodiments, the property table may contain different or additional information about each home, or additional information about each home may be contained in another table. For example, row **1711** of the property table indicates that the home having property ID 11111111, for which attribute values are specified by rows **1611-1623** of the property attribute value table has address 1234 Holly Avenue, is located in King County, in the city of Seattle, in the State of Washington, and has the zip code 98122. When the facility receives an attribute value for a home not corresponding to a row of the property table, the facility generates a new property ID identifying the home, and adds a row to the property table containing the generated property ID and other information and other information identifying the home.

[0071] FIG. **18** is a table diagram showing sample contents of the property attribute type table in the first state of the home facts database. The property attribute type table **1800** contains a row for each different attribute for which the property attribute value table can store a value, such as rows **1811-1818**. An attribute is also referred to herein as a attribute type. Each row is divided into the following columns: a PropertyAttributeTypeID **1801** containing a PropertyAttributeTypeID uniquely identifying the attribute; and a PropetyAttributeTypeDesc **1802** containing a description of the attribute. For example, row **1811** indicates that the attribute having PropertyAttributeTypeID **111**, for which values are stored in rows **1611**, **1612**, and **1624** of the property attribute value table, has the description "number of bedrooms." In order to adapt the home facts database to store values of a new attribute, this attribute and a PropertyAttributeTypeID for it simply need to be added to a new row of the property attribute type table.

[0072] FIG. **19** is a table diagram showing sample contents of the data source type table in the first state of the home facts database. The data source type table **1900** has a row for each source or type of source of attribute values, such as rows **1911-1912**. Each row is divided into the following columns: a DataSourceTypeID **1901** containing an identifier for the data source or data source type; and a DataSourceTypeDesc **1902** containing a description for this data source or data source type. For example, row **1911** indicates that the DataSourceTypeID **1**, which is the data source from which the attribute values contained in rows **1611**, **1613**, **1615**, **1616**, **1618**, **1620**, **1622**, and **1624** was obtained, is one or more local governments. Row **1911** indicates that the data source corresponding to DataSourceTypeID **2**, from which the attribute values contained in rows **1612**, **1614**, **1617**, **1619**, **1621**, and **1623** of the property attribute value table is the current owner of the corresponding home. In order to add a new data source or data source type from which attribute values may be obtained and stored in the property attribute value table, it is only necessary to

add a new row to data source type table identifying the source or source table and assigning a DataSourceTypeID to it.

[0073] FIG. **20** is a table diagram showing sample contents of the attribute value enum table in the first state of the home facts database. The attribute value enum table **2000** contains rows each corresponding to an enumerated value for an attribute whose values are enumerated, such as rows **2011-2017**. Each row is divided into the following columns: an AttributeValueEnumID **2001** containing an AttributeValueEnumID identifying the enumerated value; a PropertyAttributeTypeID column **2002** containing a PropertyAttributeTypeID of the attribute for which the enumerated value is available; and an AttributeValueEnumDesc column **2003** containing a description of the enumerated value. For example, rows **2011-2013** each define one of three different enumerated values for the attribute having PropertyAttributeTypeID **118**, i.e., the roof type attribute defined by row **1818** of the Property Attribute Type table shown in FIG. **18**. Row **2011** indicates that, for this attribute, the enumerated value composite is assigned AttributeValueEnumID **1**. Rows **2012** and **2013** respectively indicate that the enumerated value cedar shake is assigned AttributeValueEnumID **2**, while the enumerated value clay tile is assigned AttributeValueEnumID **3**. Rows **2014-2017** similarly define enumerated values for the attribute having PropertyAttributeTypeID **116**, i.e., the cooling attribute defined in row **1816** of the property attribute type table. Where enumerated values of a new attribute are to be stored in the property attribute value table, each of those enumerated values should be defined by adding a new row to the attribute value enum table.

[0074] FIG. **21** is a table diagram showing sample contents of the attribute usage table in a first state of the home facts database. The attribute usage table **2100** has a row for each different attribute value usage, such as rows **2111-2114**. Each row is divided into the following columns: an AttributeUsageID column **2101** containing an attribute usage ID assigned to the usage to which the row corresponds; an AttributeUsageDescription column **2102** that contains a description of the usage; an AttributeDataTypeID column **2103** that contains a data type selected for the usage; and an AttributeUnitTypeID column **2104** that, for usages in which the value is expressed in a particular unit, contains an indication of that unit. For example, row **2111** indicates that the usage having AttributeUsageID 1 is a whole number based upon the integer data type, and does not have any units. This usage is employed in the following rows of the property attribute value table shown in FIG. **16**: **1611-1614**, **1618**, **1619**, **1622**, and **1624**.

[0075] Based upon the foregoing, it can be seen that the first state of the home facts database reflects the attribute values shown in FIG. **12** and originally obtained from a first source, as well as the values shown in FIG. **13** and provided by the owner of the home. It can be seen that the owner, having DataSourceTypeID **2**, provided values for the following attributes: the number of bedrooms attribute having PropertyAttributeTypeID **111** (row **1612**); the number of bathrooms attribute having PropertyAttributeTypeID **112** (row **1613**); the home size attribute having PropertyAttributeTypeID **114** (row **1617**); the total number of rooms having PropertyAttributeTypeID **115** (row **1619**); the cooling attribute having PropertyAttributeTypeID **116** (row **1621**); and the roof type property having PropertyAttributeTypeID **118** (row **1623**). The owner failed to provide a value for, among other attributes, the lot size attribute having PropertyAttributeTypeID **113**. The original data source, on the other hand, failed to provide a value for the roof type attribute, having PropertyAttributeTypeID **118**.

[0076] FIGS. **22** and **23** relate to a second state of the home facts database, reflecting the addition of a new attribute to the home facts database. FIG. **22** is a table diagram showing sample contents of the property attribute type table in the second state of the home facts database. It can be seen in table **2200** that row **2219** has been added to the property attribute type table shown in FIG. **18**. Row **2219** defines a new attribute, school district, and assigns to it a PropertyAttributeTypeID **140**. The addition of this row to the property attribute type table to store values for this new attribute, and attribute value sources, such as the owner, to provide values for this new attribute.

[0077] FIG. **23** is a table diagram showing several contents of the property attribute value table in the second state of the home facts database. It can be seen from this table **2300** that a new row **2325** has been added to table **1600** shown in FIG. **16**. It shows that, subsequent to adding the new row **2219** to the property attribute type table, the owner of the home having property ID 11111111 provided the attribute value **203** for the new school district attribute.

[0078] FIGS. **24-25** show a third state of the home facts database reflecting the addition of a new data source to the home facts database. FIG. **24** is a table diagram showing sample contents of the data source type table in the third state of the home facts database. The table **2400** shows the addition of a new row **2413** corresponding to a new source of attribute values, a verified agent, i.e., a real estate agent verified as acting on behalf of the current owner of the home. Row **2413** assigns this data source the DataSourceTypeID **3**.

[0079] FIG. **25** is a table diagram showing sample contents of the property attribute value table **2500** in the third state of the home facts database. The table **2500** shows the addition of new row **2526** which indicates that the value **5350** for the lot size attribute having property attribute type **113** has been obtained from the verified agent data source. This is consistent with the owner's agent performing or commissioning a survey of the lot size and determining that it is slightly larger than the value attributed by the local government data source.

[0080] In some embodiments, the AttributeUsageID and/or UseRank columns shown in the property attribute value table are relocated to the property attribute type table, such that they are stored only once for each attribute, as opposed to once for each combination of attribute, home, data source, and sequence number.

[0081] In some embodiments, the facility employs various approaches to selecting from among and/or combining attribute values for the same home obtained from different sources. In some embodiments, the facility employs an ordering of data sources called an attribute value source authority precedence that specifies, where more than one data source provides a value for the same home and attribute, which is to be considered the most authoritative. The facility may maintain and apply a single attribute value source authority precedence across all attributes, or multiple attribute value source authority precedences that are each targeted to a single attribute or a larger proper subset of the full list of attributes.

[0082] In some embodiments, the facility enables a user to identify himself or herself as the owner of a home without immediately editing the home facts associated with that home.

[0083] In some embodiments, the facility omits IP address blacklisting from the process it performs to determine whether to identify a user as the owner of a home.

[0084] It will be appreciated by those skilled in the art that the above-described facility may be straightforwardly adapted or extended in various ways. For example, the facility may employ a variety of database schemas and may store values of a variety of types for attributes of all sorts of homes or other properties. While the foregoing description makes reference to particular embodiments, the scope of the invention is defined solely by the claims that follow and the elements recited therein.

We claim:

1. A method in a computing system for constructing a repository containing attribute information for a plurality of homes, comprising, for each of the plurality of homes:

procuring values for attributes among a plurality of attributes that were attributed to the home by a government agency;

storing the procured attribute values for the home with an indication that they were attributed to the home by a government agency;

providing a mechanism for a user to identify himself as an owner of the home;

where the mechanism is used to identify a user as an owner of the home, obtaining from the user values for attributes among the plurality of attributes;

storing the obtained attribute values for the home with an indication that they were attributed to the home by an owner of the home, such that all of the procured attribute values and all of the obtained attribute values are simultaneously stored; and

making available for display by any user both the procured and obtained attribute values for the home.

2. The method of claim **1** wherein providing the mechanism comprises:

posing a question whose answer would be known to the owner of the home;

receiving an answer to the posed question from a user;

only if the received answer is correct, identifying the user as the owner of the home;

if the received answer is incorrect:

obtaining credit card information from the user;

determining whether the obtained credit card information is associated with a valid credit card; and

only if the obtained credit card information is associated with a valid credit card, identifying the user as the owner of the home.

3. The method of claim **1** wherein providing the mechanism comprises:

obtaining credit card information from the user;

determining whether the obtained credit card information is associated with a valid credit card; and

only if the obtained credit card information is associated with a valid credit card, identifying the user as the owner of the home.

4. A computer-readable medium whose contents cause a computing system to perform a method for constructing a repository containing attribute information for a plurality of properties, the method comprising, for each of the plurality of properties:

procuring values for attributes among a plurality of attributes that were attributed to the property by a government agency;

storing the procured attribute values for the property with an indication that they were attributed to the property by a government agency;

providing a mechanism for a user to identify himself as an owner of the property;

where the mechanism is used to identify a user as an owner of the property, obtaining from the user values for attributes among the plurality of attributes;

storing the obtained attribute values for the property with an indication that they were attributed to the property by an owner of the property, such that all of the procured attribute values and all of the obtained attribute values are simultaneously stored; and

making available for display by any user both the procured and obtained attribute values for the property.

5. A computer-readable medium whose contents cause a computing system to perform a method for publishing information about a distinguished home, the method comprising:

identifying a distinguished user as the owner of the distinguished home if the distinguished user can either (1) answer a question whose answer is likely to be known by the present owner of the distinguished home or (2) provide credit card information associated with a valid credit card;

if the distinguished user is identified as the owner of the distinguished home:

receiving information about the distinguished home from the distinguished user; and

including the received information in a web page relating to the distinguished home that is available for retrieval by any user without restriction.

6. The computer-readable medium of claim **5** wherein the received information specifies values for one or more home attributes.

7. The computer-readable medium of claim **5**, further comprising:

automatically determining a valuation of the distinguished home based at least in part on at least a portion of the received information; and

including the determined valuation in a web page relating to the distinguished home that is available for retrieval by any user without restriction.

8. The computer-readable medium of claim **5**, further comprising identifying a distinguished user as the owner of the distinguished home if the distinguished user provides documentary evidence that the distinguished user is the owner of the distinguished home.

9. The computer-readable medium of claim **5**, further comprising identifying a distinguished user as the owner of the distinguished home if the distinguished user provides a copy of a deed showing the distinguished user to be the owner of the distinguished home.

10. The computer-readable medium of claim **5**, further comprising identifying a distinguished user as the owner of the distinguished home if the distinguished user provides a copy of a title showing the distinguished user to be the owner of the distinguished home.

11. The computer-readable medium of claim **5**, further comprising identifying a distinguished user as the owner of the distinguished home if the distinguished user provides a copy of a mortgage statement showing the distinguished user to be the owner of the distinguished home.

12. The computer-readable medium of claim **5**, further comprising identifying a distinguished user as the owner of the distinguished home if the distinguished user provides a copy of a property tax assessment showing the distinguished user to be the owner of the distinguished home.

13. The computer-readable medium of claim **5**, further comprising identifying a distinguished user as the owner of the distinguished home if the distinguished user provides a copy of a property tax bill showing the distinguished user to be the owner of the distinguished home.

14. The computer-readable medium of claim **5**, further comprising:

determining that the distinguished user and a second user are both simultaneously identified as the owner of the distinguished home; and

in response to the determining, initiating a manual process to identify a single owner of the distinguished home.

15. One or more computer memories collectively containing a data structure containing home attribute values for a plurality of homes and a plurality of home attributes, comprising, for each of the plurality of homes, for each of a plurality of attribute value sources, the capacity to store values for any of the plurality of home attributes obtained from the attribute value source.

16. The computer memories of claim **15** wherein the data structure comprises an attribute value table, each row of which contains indications of:

a home;

a home attribute;

an attribute value source; and

a value for the indicated home attribute attributed to the indicated home by the indicated attribute value source,

such that the table may simultaneously contain multiple rows for the same home and home attribute and different attribute value sources,

and such that any rows the table indicating a distinguished home may be used to display information about the distinguished home.

17. The computer memories of claim **16** wherein the data structure further comprises an attribute table, each row of which contains information identifying a different home attribute,

and wherein each row of the attribute value table indicates an attribute by containing a reference to a row of the attribute table whose contents identify the attribute,

such that the addition of a row to the attribute table whose contents identify a new home attribute enables rows to be added to the attribute value table that indicate values for the new home attribute.

18. The computer memories of claim **16** wherein the data structure contains both (1) a first row indicating a distinguished home, a distinguished home attribute, a first attribute value source, and a first value for the distinguished home attribute attributed to the distinguished home by the first attribute value source, and (2) a second row indicating the distinguished home, the distinguished home attribute, a second attribute value source that differs from the first attribute value source, and a second value for the distinguished home attribute attributed to the distinguished home by the second attribute value source that differs from the first value for the distinguished home attribute.

19. The computer memories of claim **18** wherein the first attribute value source is a government agency and the second attribute value source is a user identified as an owner of the distinguished home.

20. The computer memories of claim **15** wherein the data structure further comprises information indicating at least one attribute value source authority precedence, each attribute value source authority precedence specifying, for a designated attribute, a relative level of authority to be attributed to each of a plurality of attribute value sources providing values for the designated attribute.

21. One or more generated data signals collectively conveying a home attribute display data structure, the data structure having contents for causing a display device to display visual information that (a) identifies a home, (b) conveys a first value for a home attribute obtained from a first source, and (c) conveys a second value for the home attribute obtained from a second source distinct from the first source.

22. The generated data signals of claim **19** wherein the data structure further has contents for causing a display device to display visual information that (d) identifies the first source, and (e) identifies the second source.

23. A computing system for aggregating home attribute values, comprising:

an import module that imports home attribute values exported by one or more external electronic data sources;

a web serving module that serves web pages usable by authorized users to input home attribute values; and

a home facts repository that stores both home attribute values imported by the import module and home attribute values inputted via web pages served by the web serving module.

24. The computing system of claim **23** wherein the web serving module further serves web pages to users without restriction that contain both home attribute values imported by the import module and home attribute values inputted via web pages served by the web serving module.

25. A method in a computing system for managing home attribute values, comprising:

obtaining a value for an attribute of a home from a data source; and

adding a row to a first table indicating the received value and identifying the home, the attribute, and the data source, the first table containing a plurality of rows each corresponding to a value of one of a plurality of attributes of one of a plurality of homes obtained from one of a plurality of data sources.

26. The method of claim **25** wherein no attribute value has previously been obtained from the data source from which the attribute value is obtained, and wherein the row added to the first table identifies the data source from which the value is obtained by containing an identifier for the data source from which the value is obtained, the method further comprising:

selecting the value of the identifier for the data source from which the value is obtained; and

adding a row to a second table containing the selected value of the identifier and additional identifying information for the data source from which the value is obtained.

27. The method of claim **25** wherein no value has previously been obtained for the attribute for which the value is obtained, and wherein the row added to the first table identifies the attribute for which the value is obtained by containing an identifier for the attribute for which the value is obtained, the method further comprising:

selecting the value of the identifier for the attribute for which the value is obtained; and

adding a row to a second table containing the selected value of the identifier and additional identifying information for the attribute for which the value is obtained.

28. The method of claim **25** wherein no attribute value has previously been obtained for the home for which the attribute value is obtained, and wherein the row added to the first table identifies the data source from which the value is obtained by containing an identifier for the home for which the value is obtained, the method further comprising:

selecting the value of the identifier for the home for which the value is obtained; and

adding a row to a second table containing the selected value of the identifier and additional identifying information for the home for which the value is obtained.

29. The method of claim **25** wherein the obtained value is an enumerated value that has not previously been obtained for the attribute for which the value is obtained, and wherein the row added to the first table indicates the obtained value by containing an identifier for the attribute for the obtained value, the method further comprising:

selecting the value of the identifier for the obtained value; and

adding a row to a second table containing the selected value of the identifier and additional identifying information for the obtained value.

30. The method of claim **25** wherein the obtained value differs from a value indicated by a row of the first table other than the added row for the same attribute and for the same home.

31. The method of claim **30**, further comprising presenting to a user at least two of the multiple values for the attribute and home contained by the first table.

32. The method of claim **30**, further comprising applying to the multiple values for the attribute and home contained by the first table a value derivation rule to produce a derived value to use for the attribute and home.

33. The method of claim **32**, further comprising using the derived value by presenting it to a user.

34. The method of claim **32**, further comprising using the derived value by generating a valuation of the home that is based upon the derived value.

35. The method of claim **32** wherein the applied value derivation rule selects one of the multiple values for the attribute and home contained by the first table as the derived value.

36. The method of claim **35** wherein the applied value derivation rule applies an attribute value source authority precedents specify a relative level of authority to be attributed to each of a plurality of attribute value sources.

37. The method of claim **32** wherein the applied value derivation rule combines the multiple values for the attribute and home contained by the first table to produce the derived value.

* * * * *