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(54) **METHOD AND SYSTEM FOR PREVIEWING RECOMMENDATION QUEUES**

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See application file for complete search history.

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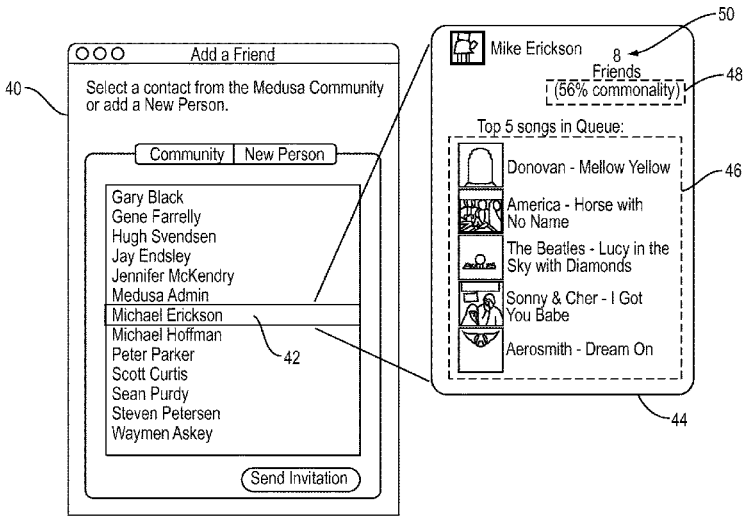
(57) **ABSTRACT**

A method and system for previewing a media item recommendation queue. A server receives a request from a first device for at least a portion of a media item recommendation queue associated with a second device. The server provides to the first device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the second device. The order of the plurality of recommendation queue entries in the media item recommendation queue is based on a plurality of priority indicators associated with the second device. The server receives a request from the first device to couple the second device to the first device and couples the second device to the first device, wherein media item recommendations generated by the second device are directed to the first device.

20 Claims, 17 Drawing Sheets



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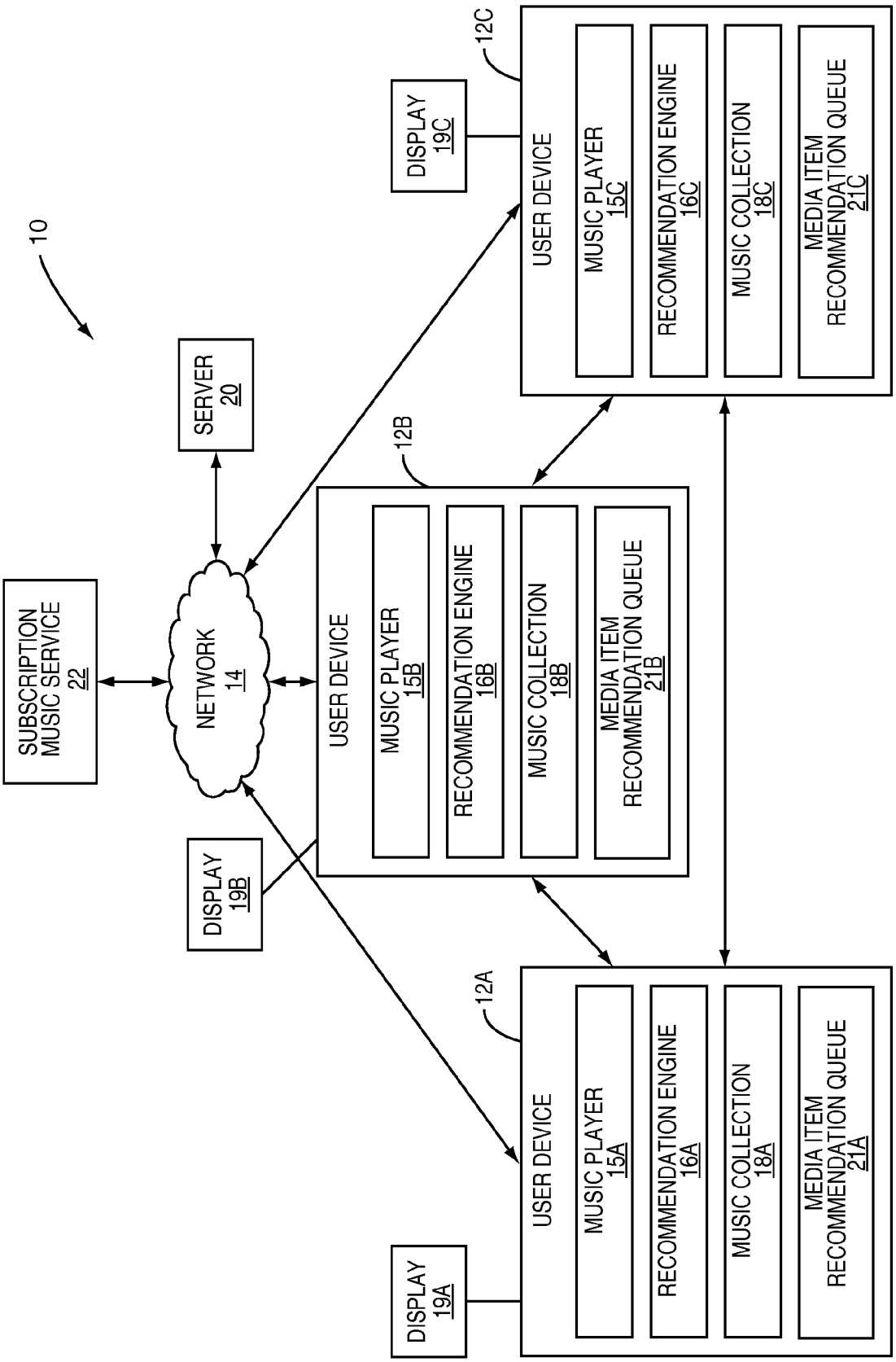
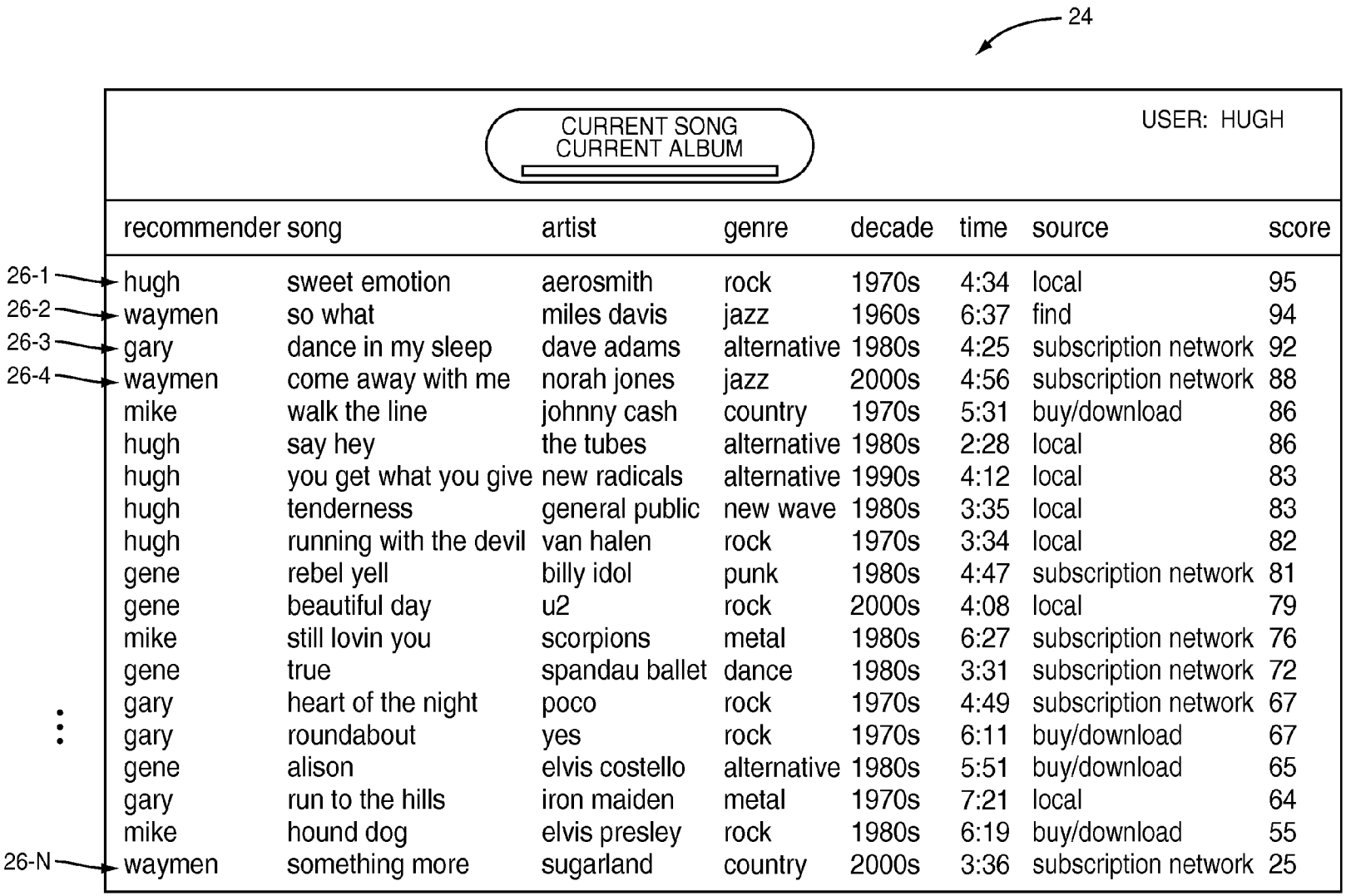

10
SERVER 20
NETWORK 14
SUBSCRIPTION MUSIC SERVICE 22
DISPLAY 19A
DISPLAY 19B
DISPLAY 19C
12A
USER DEVICE
MUSIC PLAYER 15A
RECOMMENDATION ENGINE 16A
MUSIC COLLECTION 18A
MEDIA ITEM RECOMMENDATION QUEUE 21A
12B
USER DEVICE
MUSIC PLAYER 15B
RECOMMENDATION ENGINE 16B
MUSIC COLLECTION 18B
MEDIA ITEM RECOMMENDATION QUEUE 21B
12C
USER DEVICE
MUSIC PLAYER 15C
RECOMMENDATION ENGINE 16C
MUSIC COLLECTION 18C
MEDIA ITEM RECOMMENDATION QUEUE 21C

FIG. 1



recommender	song	artist	genre	decade	time	source	score
hugh	sweet emotion	aerosmith	rock	1970s	4:34	local	95
waymen	so what	miles davis	jazz	1960s	6:37	find	94
gary	dance in my sleep	dave adams	alternative	1980s	4:25	subscription network	92
waymen	come away with me	norah jones	jazz	2000s	4:56	subscription network	88
mike	walk the line	johnny cash	country	1970s	5:31	buy/download	86
hugh	say hey	the tubes	alternative	1980s	2:28	local	86
hugh	you get what you give	new radicals	alternative	1990s	4:12	local	83
hugh	tenderness	general public	new wave	1980s	3:35	local	83
hugh	running with the devil	van halen	rock	1970s	3:34	local	82
gene	rebel yell	billy idol	punk	1980s	4:47	subscription network	81
gene	beautiful day	u2	rock	2000s	4:08	local	79
mike	still lovin you	scorpions	metal	1980s	6:27	subscription network	76
gene	true	spandau ballet	dance	1980s	3:31	subscription network	72
gary	heart of the night	poco	rock	1970s	4:49	subscription network	67
gary	roundabout	yes	rock	1970s	6:11	buy/download	67
gene	alison	elvis costello	alternative	1980s	5:51	buy/download	65
gary	run to the hills	iron maiden	metal	1970s	7:21	local	64
mike	hound dog	elvis presley	rock	1980s	6:19	buy/download	55
waymen	something more	sugarland	country	2000s	3:36	subscription network	25

FIG. 2

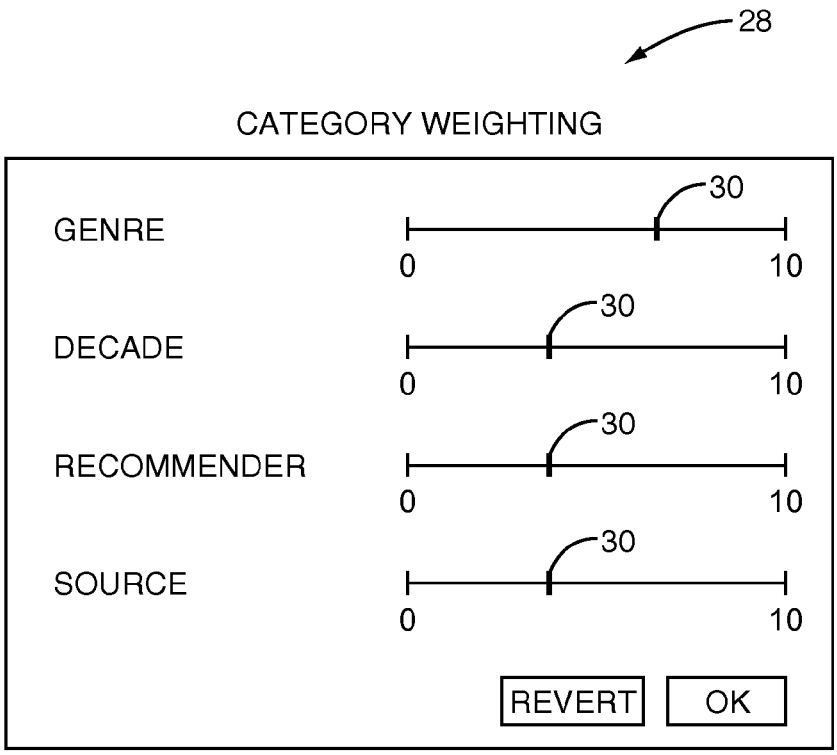

28
CATEGORY WEIGHTING
GENRE
30
0
10
DECADE
30
0
10
RECOMMENDER
30
0
10
SOURCE
30
0
10
REVERT
OK

FIG. 3

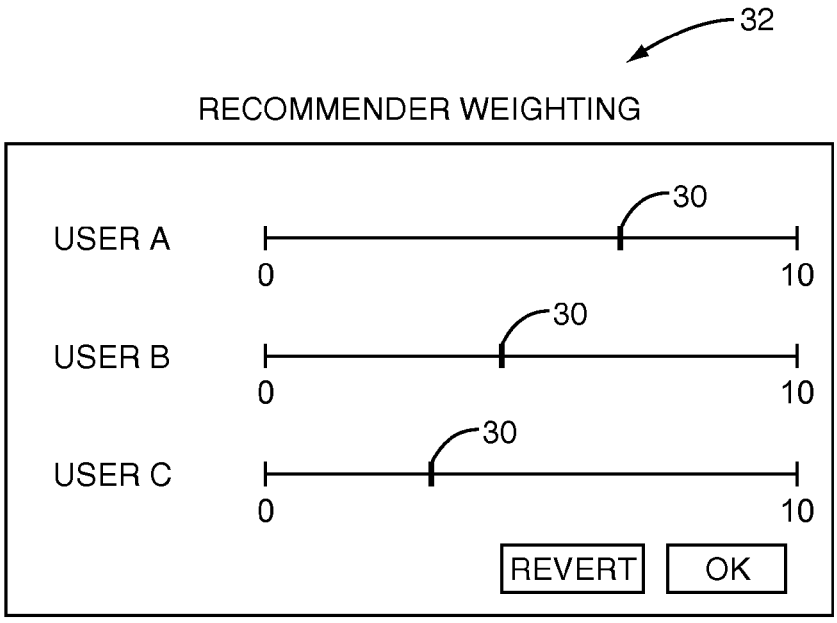

32
RECOMMENDER WEIGHTING
USER A
30
0
10
USER B
30
0
10
USER C
30
0
10
REVERT
OK

FIG. 4

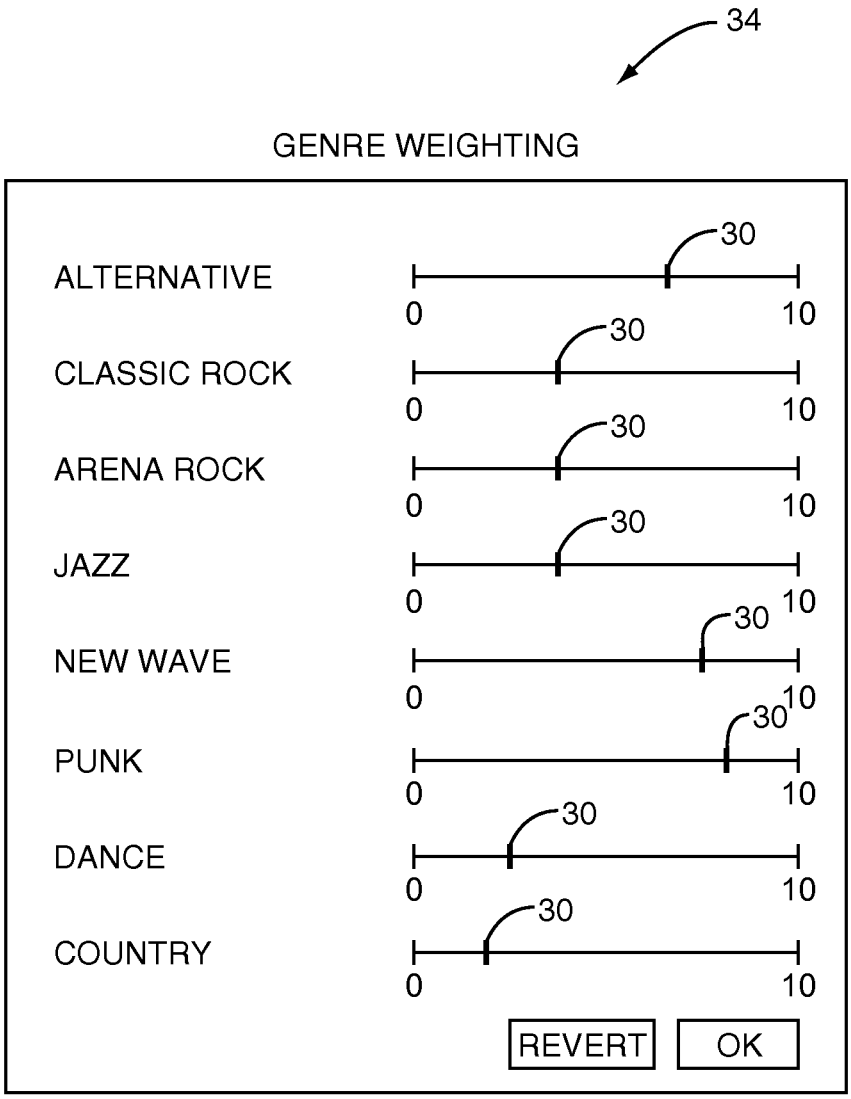

34
GENRE WEIGHTING
ALTERNATIVE
CLASSIC ROCK
ARENA ROCK
JAZZ
NEW WAVE
PUNK
DANCE
COUNTRY
30
0
10
REVERT
OK

FIG. 5

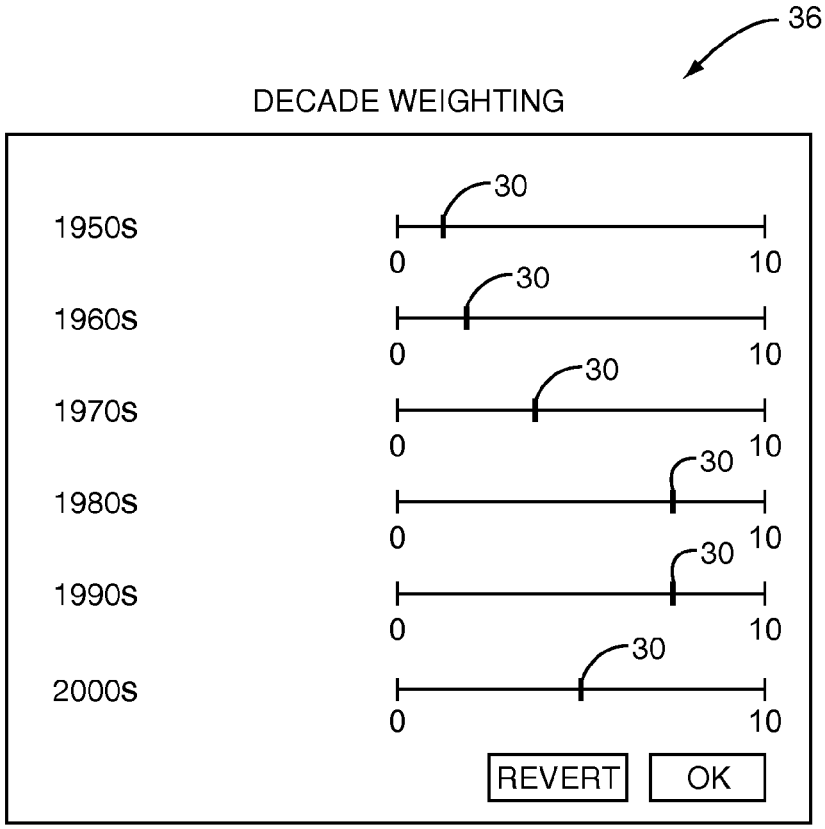

36
DECADE WEIGHTING
1950S
1960S
1970S
1980S
1990S
2000S
30
0
10
REVERT
OK

FIG. 6

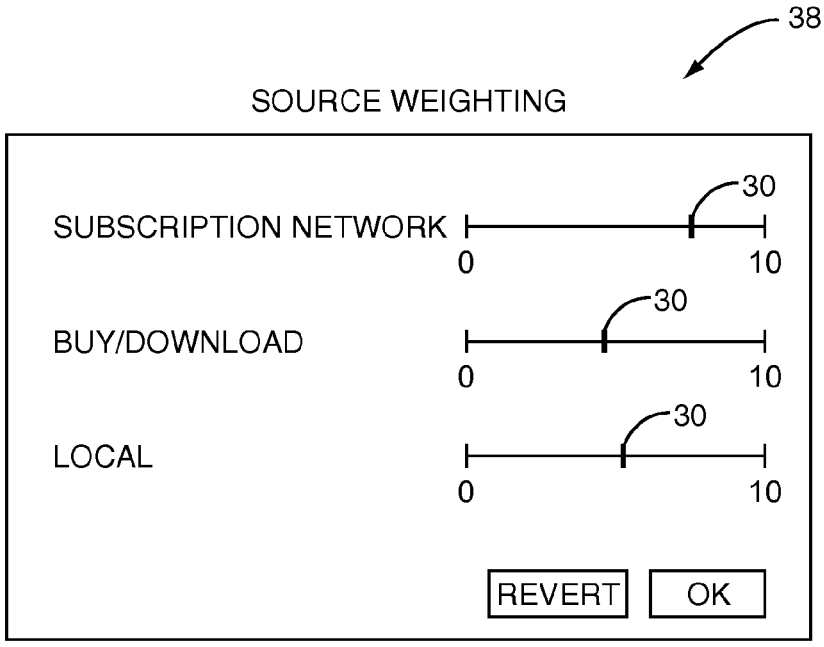

38
SOURCE WEIGHTING
SUBSCRIPTION NETWORK
BUY/DOWNLOAD
LOCAL
30
0
10
REVERT
OK

FIG. 7

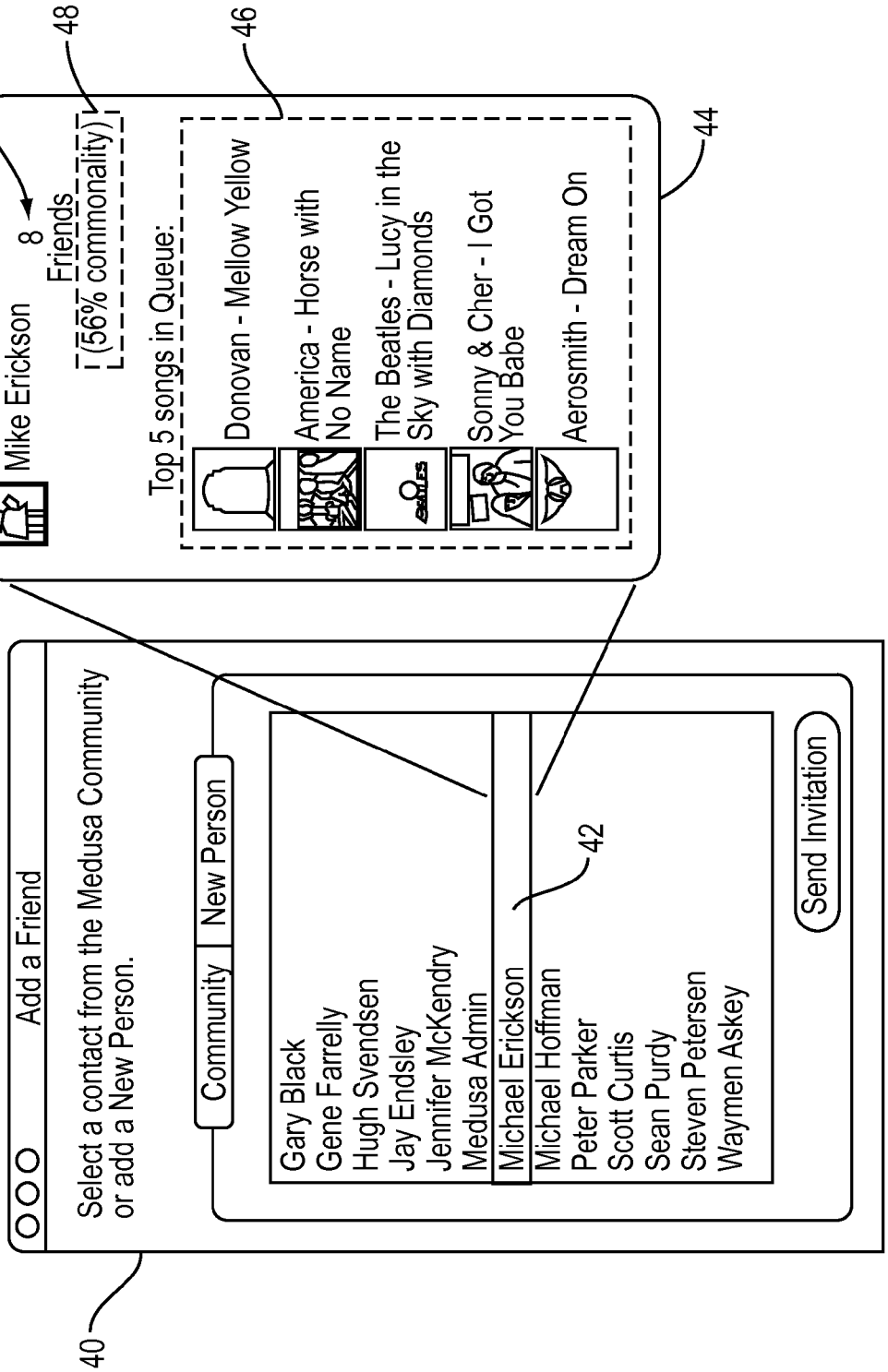

50
48
46
44
Mike Erickson
8 Friends
(56% commonality)
Top 5 songs in Queue:
Donovan - Mellow Yellow
America - Horse with No Name
The Beatles - Lucy in the Sky with Diamonds
Sonny & Cher - I Got You Babe
Aerosmith - Dream On
Add a Friend
Select a contact from the Medusa Community or add a New Person.
Community
New Person
Gary Black
Gene Farrelly
Hugh Svendsen
Jay Endsley
Jennifer McKendry
Medusa Admin
Michael Erickson
Michael Hoffman
Peter Parker
Scott Curtis
Sean Purdy
Steven Petersen
Waymen Askey
42
Send Invitation
40

FIG. 8

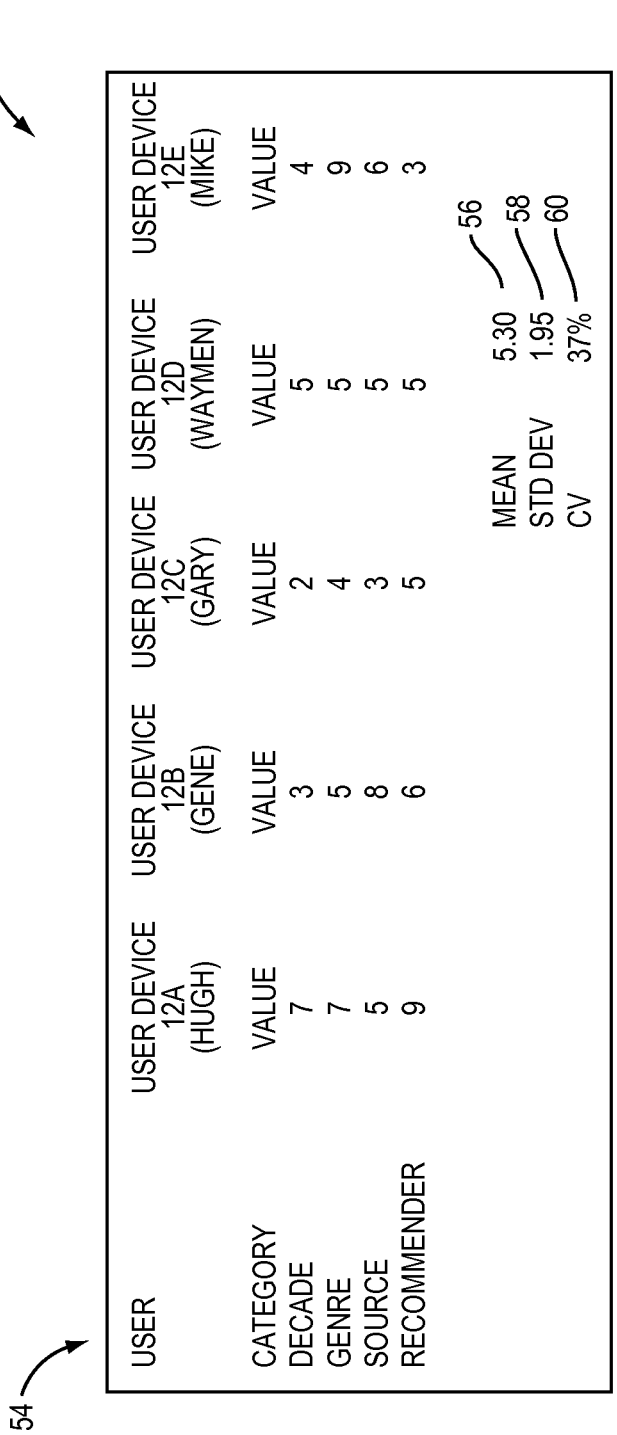

52
54
USER
USER DEVICE 12A (HUGH)
USER DEVICE 12B (GENE)
USER DEVICE 12C (GARY)
USER DEVICE 12D (WAYMEN)
USER DEVICE 12E (MIKE)
CATEGORY
VALUE
VALUE
VALUE
VALUE
VALUE
DECADE
7
3
2
5
4
GENRE
7
5
4
5
9
SOURCE
5
8
3
5
6
RECOMMENDER
9
6
5
5
3
MEAN
5.30
56
STD DEV
1.95
58
CV
37%
60

FIG. 9

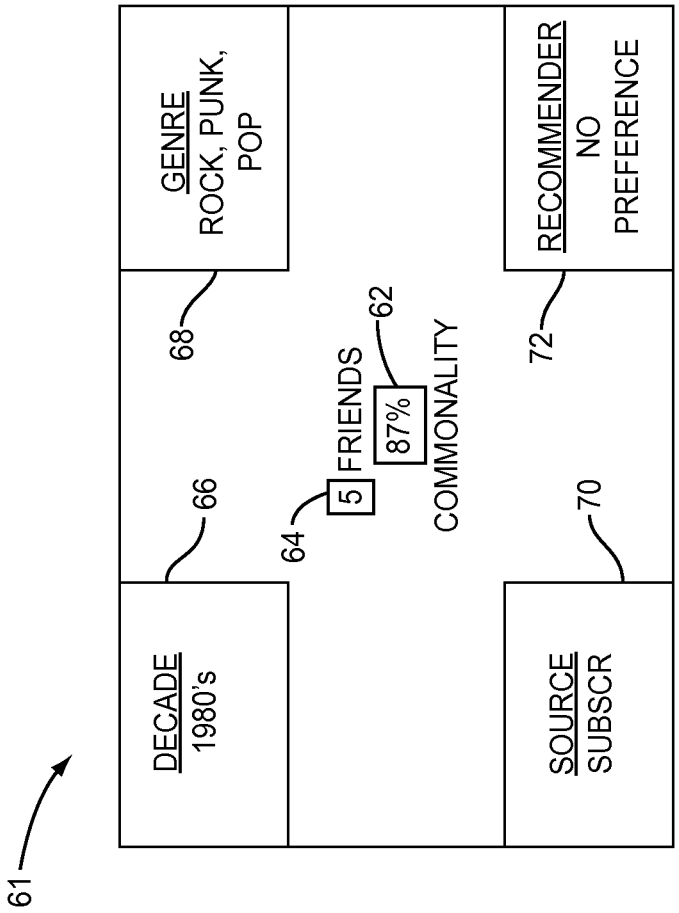

61
DECADE
1980's
66
GENRE
ROCK, PUNK,
POP
68
5 FRIENDS
64
87%
COMMONALITY
62
SOURCE
SUBSCR
70
RECOMMENDER
NO
PREFERENCE
72

FIG. 10

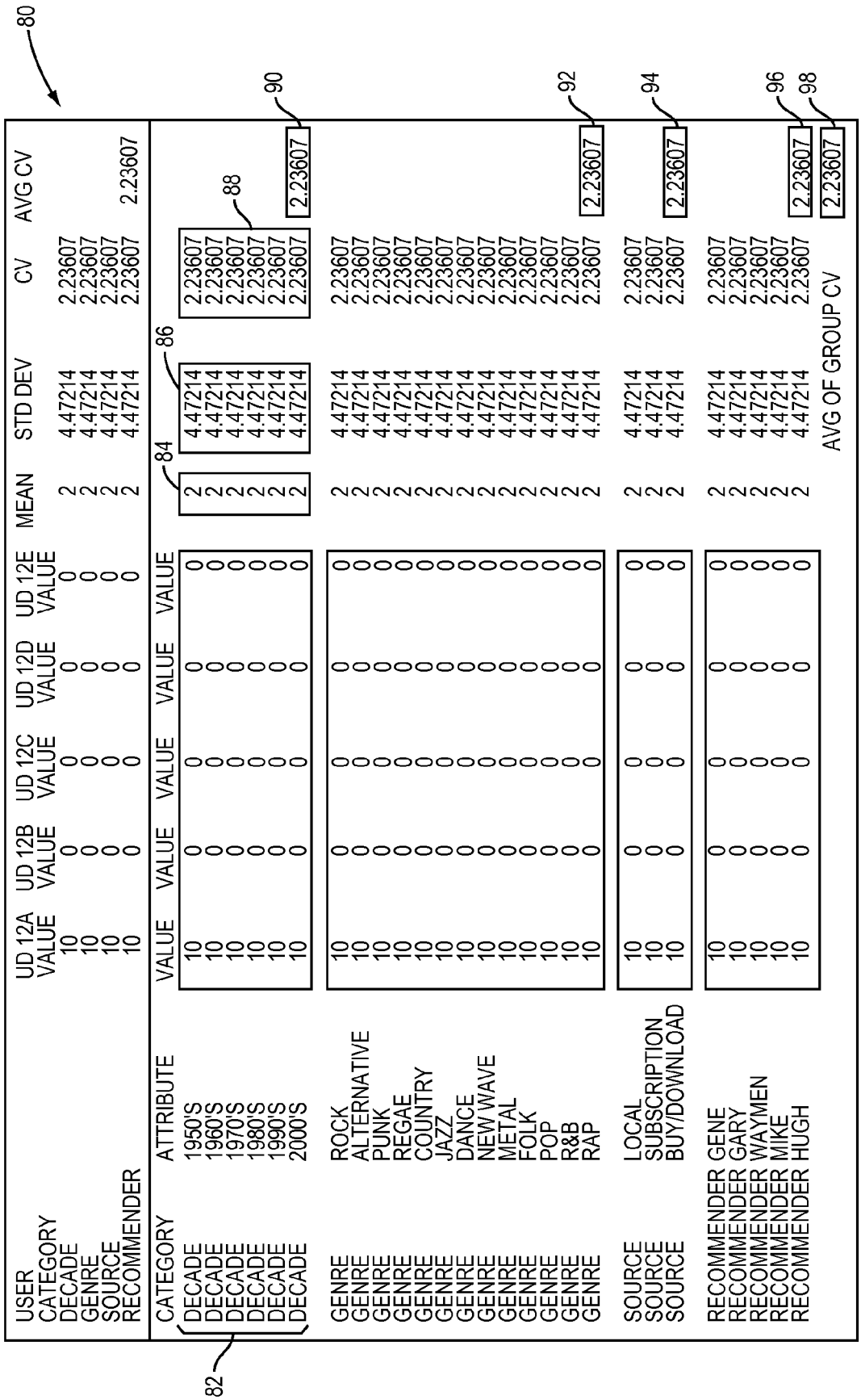

80
82
84
86
88
90
92
94
96
98
USER
CATEGORY
DECADE
GENRE
SOURCE
RECOMMENDER
UD 12A VALUE
UD 12B VALUE
UD 12C VALUE
UD 12D VALUE
UD 12E VALUE
MEAN
STD DEV
CV
AVG CV
10 0 0 0 0 2 4.47214 2.23607
10 0 0 0 0 2 4.47214 2.23607
10 0 0 0 0 2 4.47214 2.23607
10 0 0 0 0 2 4.47214 2.23607 2.23607
CATEGORY
ATTRIBUTE
VALUE
VALUE
VALUE
VALUE
VALUE
DECADE 1950'S 10 0 0 0 0 2 4.47214 2.23607
DECADE 1960'S 10 0 0 0 0 2 4.47214 2.23607
DECADE 1970'S 10 0 0 0 0 2 4.47214 2.23607
DECADE 1980'S 10 0 0 0 0 2 4.47214 2.23607
DECADE 1990'S 10 0 0 0 0 2 4.47214 2.23607
DECADE 2000'S 10 0 0 0 0 2 4.47214 2.23607 2.23607
GENRE ROCK 10 0 0 0 0 2 4.47214 2.23607
GENRE ALTERNATIVE 10 0 0 0 0 2 4.47214 2.23607
GENRE PUNK 10 0 0 0 0 2 4.47214 2.23607
GENRE REGAE 10 0 0 0 0 2 4.47214 2.23607
GENRE COUNTRY 10 0 0 0 0 2 4.47214 2.23607
GENRE JAZZ 10 0 0 0 0 2 4.47214 2.23607
GENRE DANCE 10 0 0 0 0 2 4.47214 2.23607
GENRE NEW WAVE 10 0 0 0 0 2 4.47214 2.23607
GENRE METAL 10 0 0 0 0 2 4.47214 2.23607
GENRE FOLK 10 0 0 0 0 2 4.47214 2.23607
GENRE POP 10 0 0 0 0 2 4.47214 2.23607
GENRE R&B 10 0 0 0 0 2 4.47214 2.23607
GENRE RAP 10 0 0 0 0 2 4.47214 2.23607 2.23607
SOURCE LOCAL 10 0 0 0 0 2 4.47214 2.23607
SOURCE SUBSCRIPTION 10 0 0 0 0 2 4.47214 2.23607
SOURCE BUY/DOWNLOAD 10 0 0 0 0 2 4.47214 2.23607 2.23607
RECOMMENDER GENE 10 0 0 0 0 2 4.47214 2.23607
RECOMMENDER GARY 10 0 0 0 0 2 4.47214 2.23607
RECOMMENDER WAYMEN 10 0 0 0 0 2 4.47214 2.23607
RECOMMENDER MIKE 10 0 0 0 0 2 4.47214 2.23607
RECOMMENDER HUGH 10 0 0 0 0 2 4.47214 2.23607 2.23607
AVG OF GROUP CV 2.23607

FIG. 11

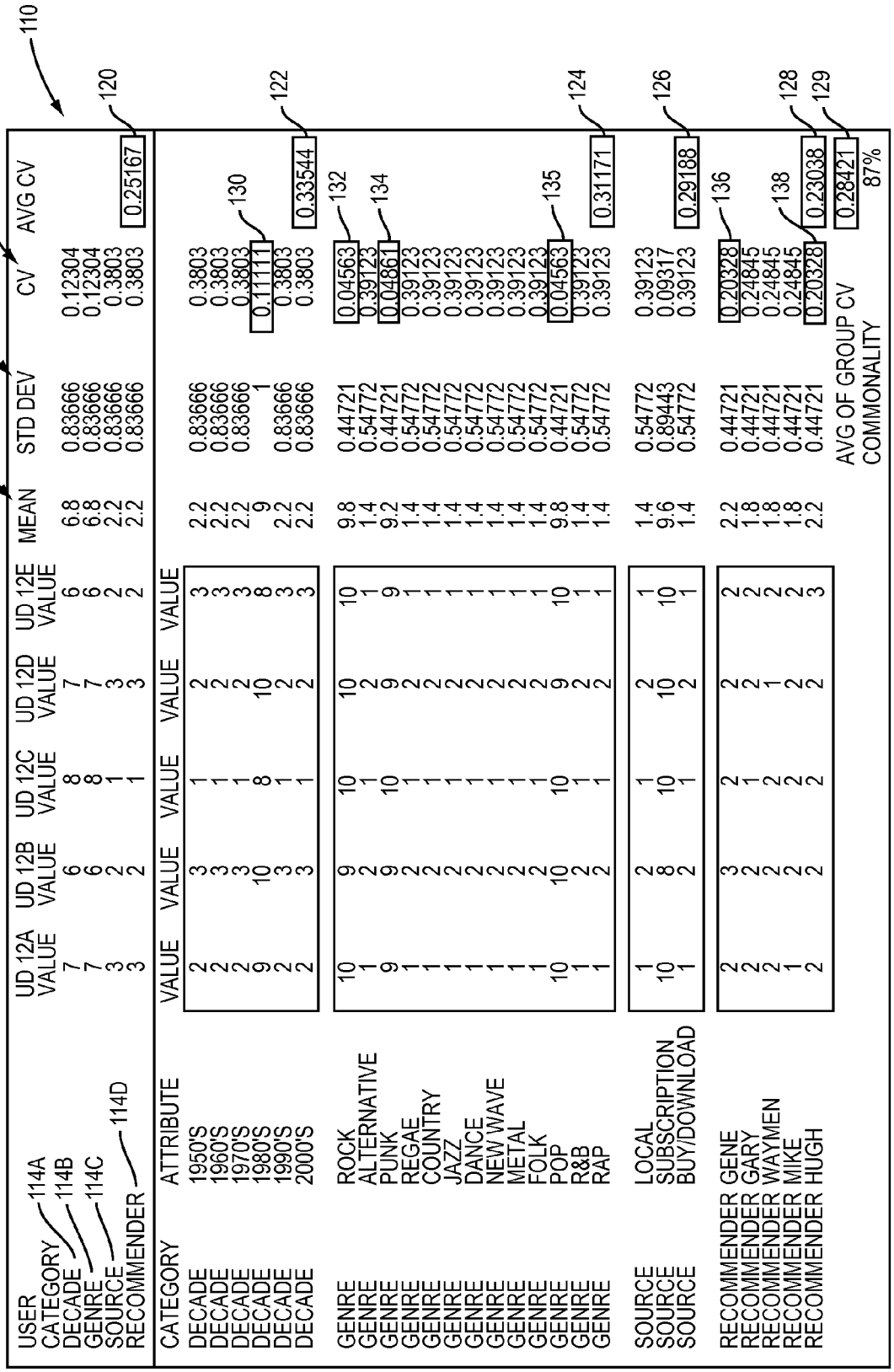

110
112
116
118
120
122
124
126
128
129
130
132
134
135
136
138
114A
114B
114C
114D
USER
CATEGORY
DECADE
GENRE
SOURCE
RECOMMENDER
UD 12A VALUE
UD 12B VALUE
UD 12C VALUE
UD 12D VALUE
UD 12E VALUE
MEAN
STD DEV
CV
AVG CV
0.25167
AVG OF GROUP CV
COMMONALITY
87%

FIG. 12

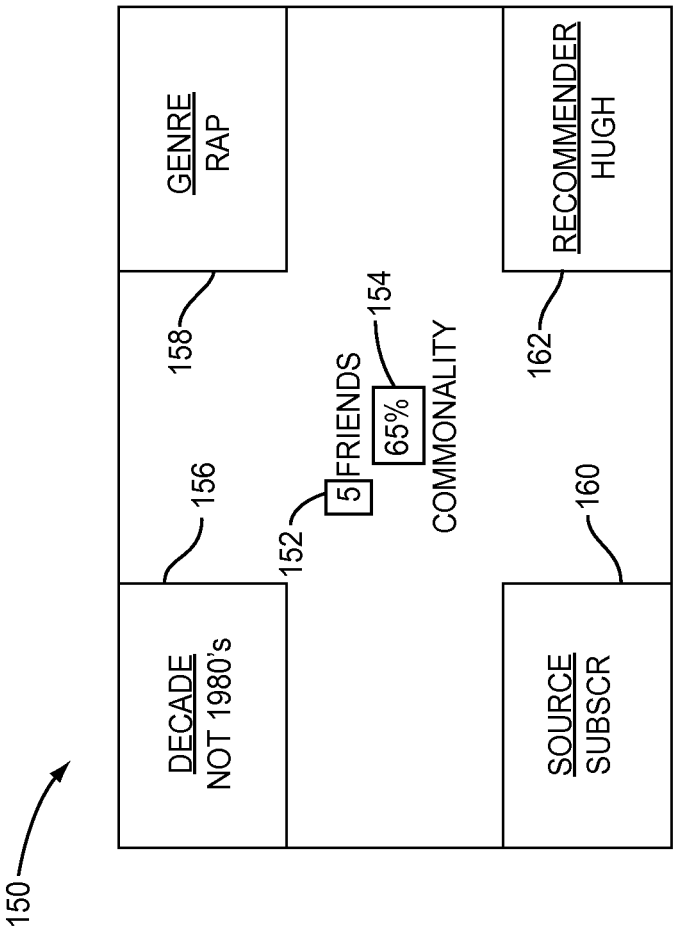

150
DECADE
NOT 1980's
156
GENRE
RAP
158
5 FRIENDS
152
65%
COMMONALITY
154
SOURCE
SUBSCR
160
RECOMMENDER
HUGH
162

FIG. 13

USER CATEGORY		UD 12A VALUE	UD 12B VALUE	UD 12C VALUE	UD 12D VALUE	UD 12E VALUE	MEAN	STD DEV	CV	AVG CV
DECADE		10	9	1	3	1	4.8	4.38178	0.91288	
GENRE		9	8	1	2	2	4.4	3.78153	0.85944	
SOURCE		1	2	1	8	10	4.4	4.27785	0.97224	
RECOMMENDER		10	7	1	1	0	3.8	4.43847	1.16802	0.97814
CATEGORY	ATTRIBUTE	VALUE	VALUE	VALUE	VALUE	VALUE				
DECADE	1950'S	10	9	1	3	1	4.8	4.38178	0.91287	
DECADE	1960'S	9	8	1	2	2	4.4	3.78153	0.85944	
DECADE	1970'S	1	2	1	8	10	4.4	4.27785	0.97224	
DECADE	1980'S	10	7	1	1	0	3.8	4.43847	1.16802	
DECADE	1990'S	2	3	1	2	3	2.2	0.83666	0.3803	
DECADE	2000'S	2	3	1	2	3	2.2	0.83666	0.3803	0.77886
GENRE	ROCK	10	9	1	3	1	4.8	4.38178	0.91287	
GENRE	ALTERNATIVE	9	8	1	2	2	4.4	3.78153	0.85944	
GENRE	PUNK	1	2	1	8	10	4.4	4.27785	0.97224	
GENRE	REGAE	10	7	1	1	0	3.8	4.43847	1.16802	
GENRE	COUNTRY	10	9	1	3	1	4.8	4.38178	0.91287	
GENRE	JAZZ	9	8	1	2	2	4.4	3.78153	0.85944	
GENRE	DANCE	1	2	1	8	10	4.4	4.27785	0.97224	
GENRE	NEW WAVE	10	7	1	1	0	3.8	4.43847	1.16802	
GENRE	METAL	10	9	1	3	1	4.8	4.38178	0.91287	
GENRE	FOLK	9	8	1	2	2	4.4	3.78153	0.85944	
GENRE	POP	1	2	1	8	10	4.4	4.27785	0.97224	
GENRE	R&B	10	7	1	1	0	3.8	4.43847	1.16802	
GENRE	RAP	1	2	1	2	1	1.4	0.54772	0.39123	0.93299
SOURCE	LOCAL	1	2	1	2	1	1.4	0.54772	0.39123	
SOURCE	SUBSCRIPTION	10	8	10	10	10	9.6	0.89443	0.09317	
SOURCE	BUY/DOWNLOAD	2	5	7	9	0	4.6	3.64692	0.79281	0.42574
RECOMMENDER	GENE	10	9	1	3	1	4.8	4.38178	0.91287	
RECOMMENDER	GARY	9	8	1	2	2	4.4	3.78153	0.85944	
RECOMMENDER	WAYMEN	1	2	1	8	10	4.4	4.27785	0.97224	
RECOMMENDER	MIKE	10	7	1	1	0	3.8	4.43847	1.16802	
RECOMMENDER	HUGH	10	10	10	10	9	9.8	0.44721	0.04563	0.79164
								AVG OF GROUP CV		0.78147
								COMMONALITY		65%

170

172

174

176

FIG. 14

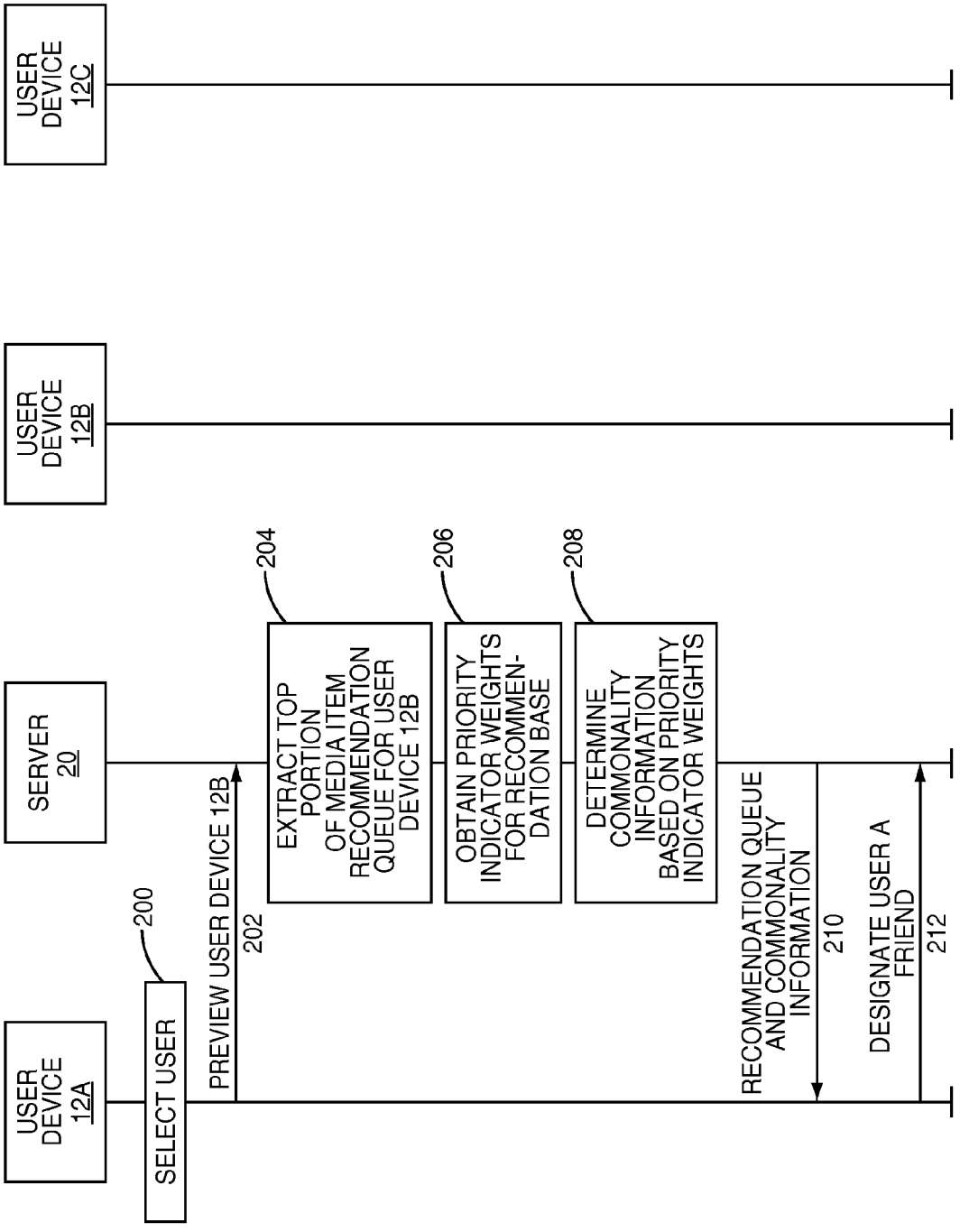

USER DEVICE 12A
SERVER 20
USER DEVICE 12B
USER DEVICE 12C
200
SELECT USER
PREVIEW USER DEVICE 12B
202
EXTRACT TOP PORTION OF MEDIA ITEM RECOMMENDATION QUEUE FOR USER DEVICE 12B
204
OBTAIN PRIORITY INDICATOR WEIGHTS FOR RECOMMEN-DATION BASE
206
DETERMINE COMMONALITY INFORMATION BASED ON PRIORITY INDICATOR WEIGHTS
208
RECOMMENDATION QUEUE AND COMMONALITY INFORMATION
210
DESIGNATE USER A FRIEND
212

FIG. 15

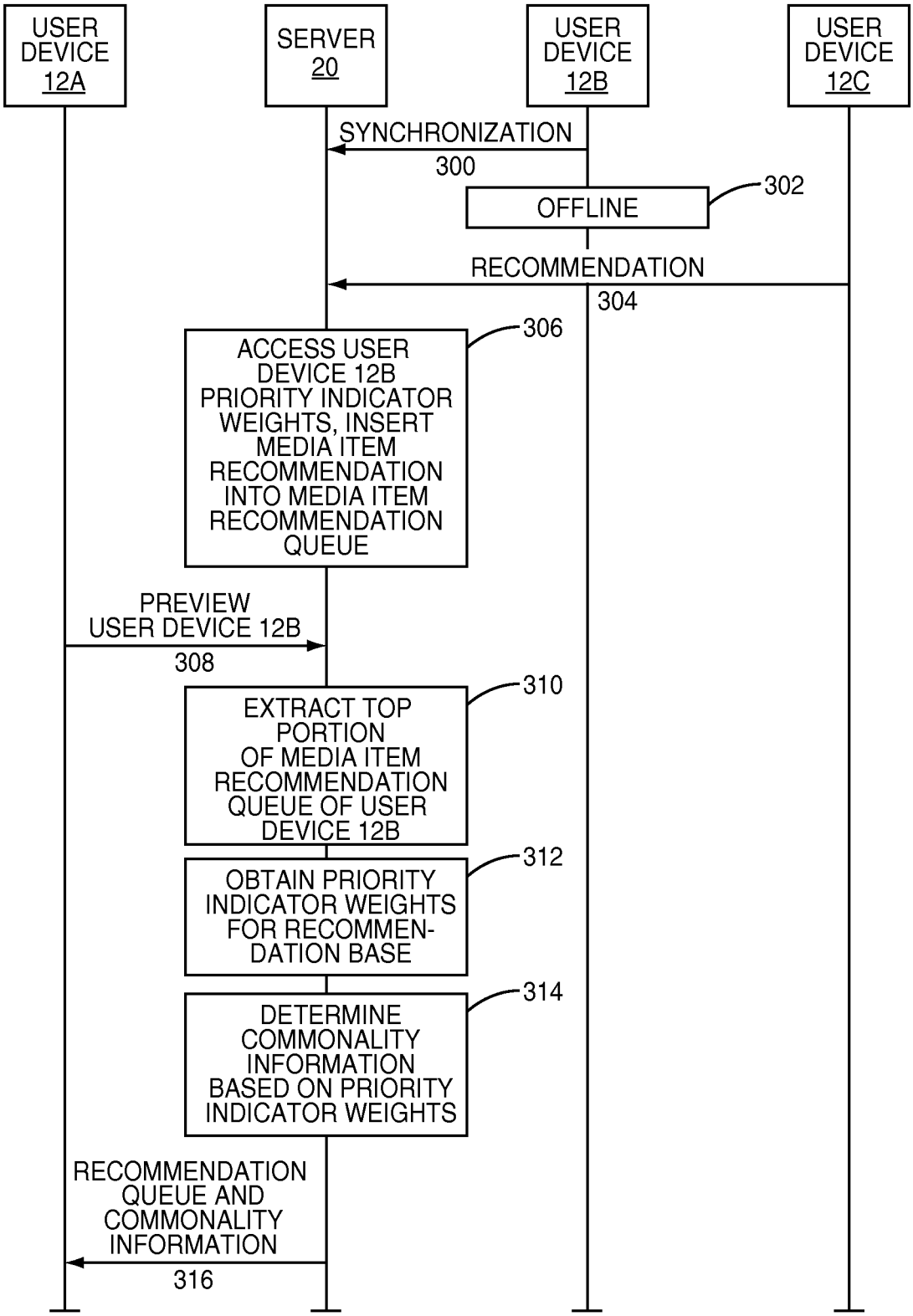

USER DEVICE 12A
SERVER 20
USER DEVICE 12B
USER DEVICE 12C
SYNCHRONIZATION
300
OFFLINE
302
RECOMMENDATION
304
ACCESS USER DEVICE 12B PRIORITY INDICATOR WEIGHTS, INSERT MEDIA ITEM RECOMMENDATION INTO MEDIA ITEM RECOMMENDATION QUEUE
306
PREVIEW USER DEVICE 12B
308
EXTRACT TOP PORTION OF MEDIA ITEM RECOMMENDATION QUEUE OF USER DEVICE 12B
310
OBTAIN PRIORITY INDICATOR WEIGHTS FOR RECOMMEN-DATION BASE
312
DETERMINE COMMONALITY INFORMATION BASED ON PRIORITY INDICATOR WEIGHTS
314
RECOMMENDATION QUEUE AND COMMONALITY INFORMATION
316

FIG. 16

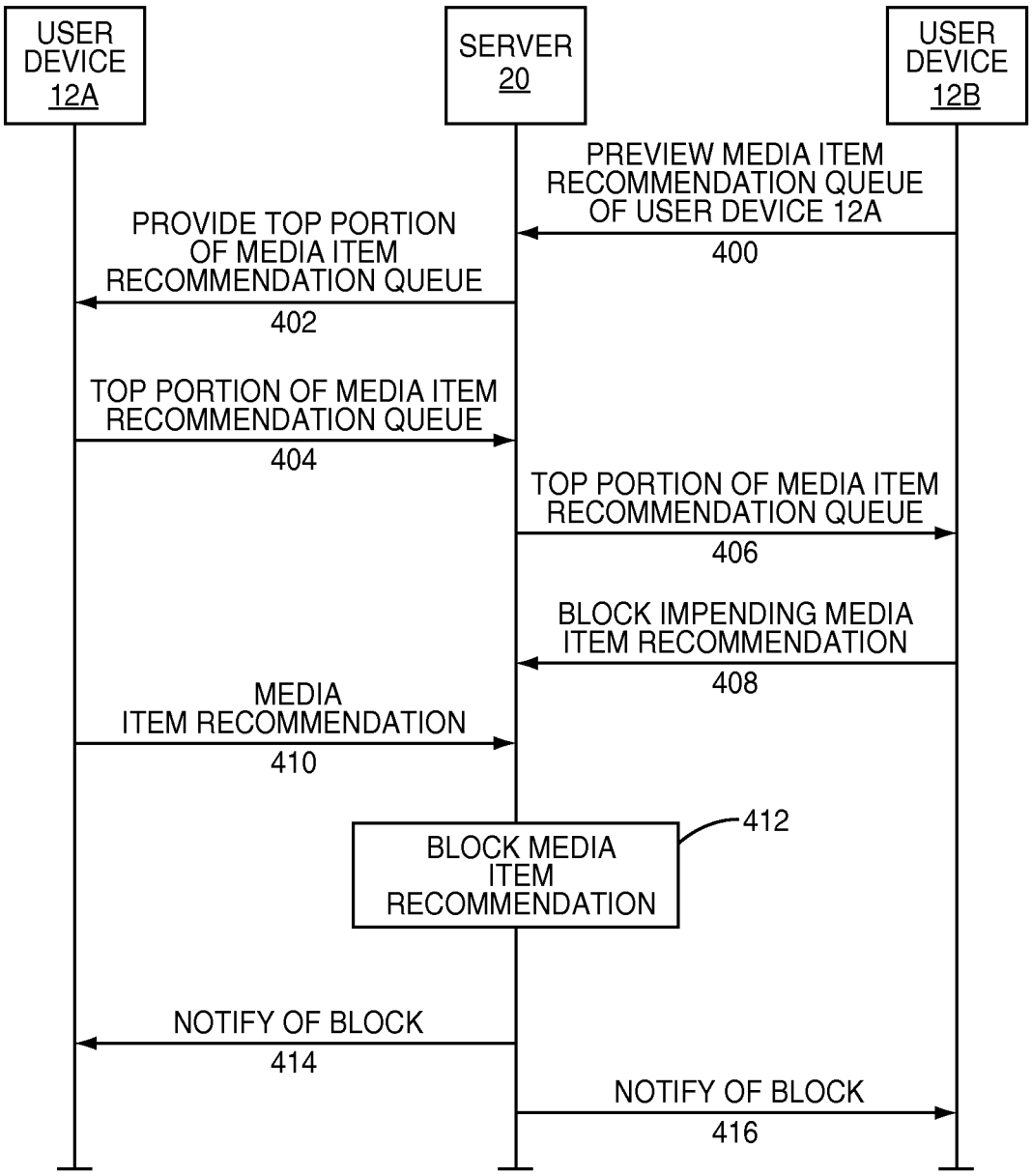

USER DEVICE 12A
SERVER 20
USER DEVICE 12B
PREVIEW MEDIA ITEM RECOMMENDATION QUEUE OF USER DEVICE 12A
400
PROVIDE TOP PORTION OF MEDIA ITEM RECOMMENDATION QUEUE
402
TOP PORTION OF MEDIA ITEM RECOMMENDATION QUEUE
404
TOP PORTION OF MEDIA ITEM RECOMMENDATION QUEUE
406
BLOCK IMPENDING MEDIA ITEM RECOMMENDATION
408
MEDIA ITEM RECOMMENDATION
410
412
BLOCK MEDIA ITEM RECOMMENDATION
NOTIFY OF BLOCK
414
NOTIFY OF BLOCK
416

FIG. 17

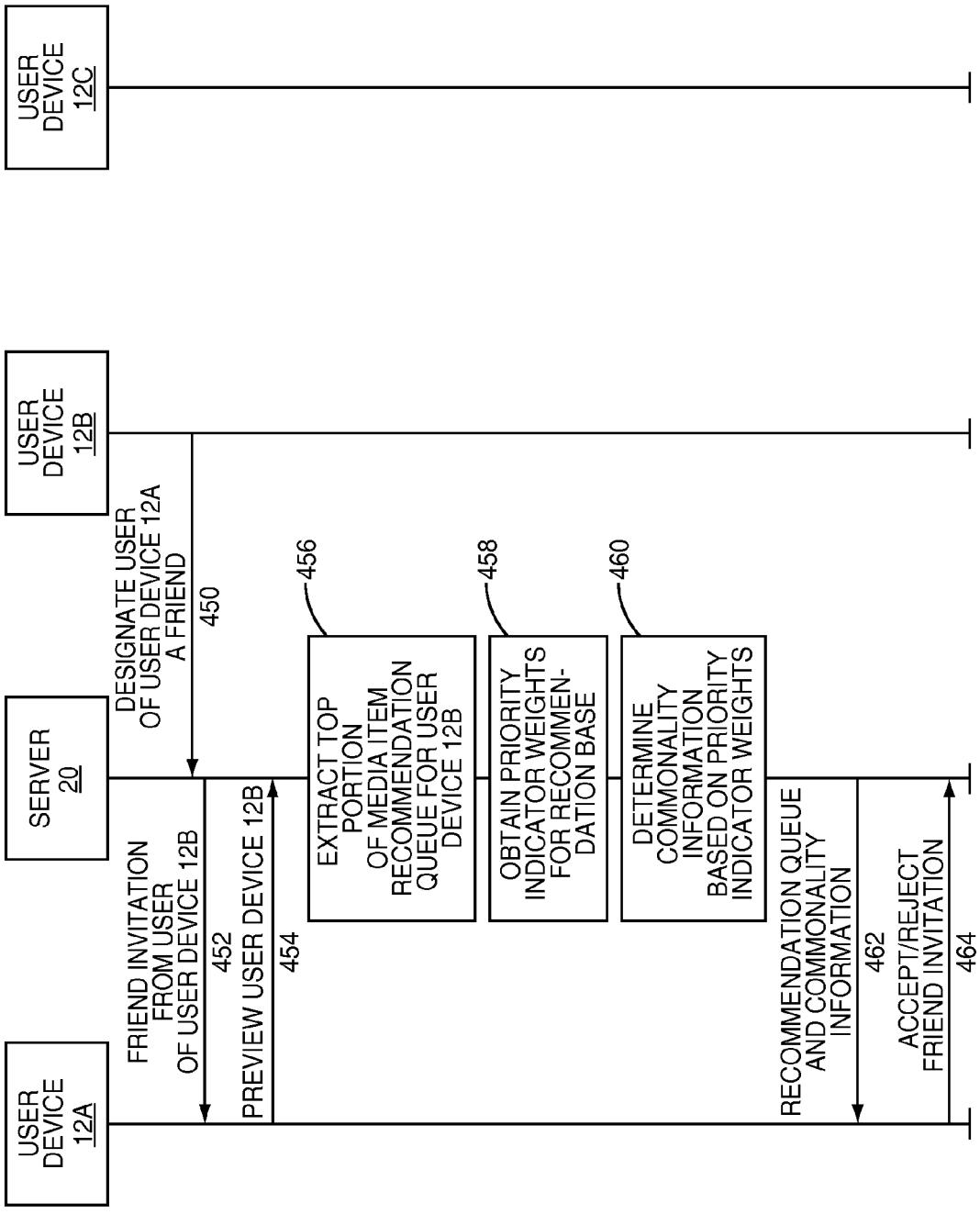

USER DEVICE 12A
SERVER 20
USER DEVICE 12B
USER DEVICE 12C
FRIEND INVITATION FROM USER OF USER DEVICE 12B
452
DESIGNATE USER OF USER DEVICE 12A A FRIEND
450
PREVIEW USER DEVICE 12B
454
EXTRACT TOP PORTION OF MEDIA ITEM RECOMMENDATION QUEUE FOR USER DEVICE 12B
456
OBTAIN PRIORITY INDICATOR WEIGHTS FOR RECOMMEN-DATION BASE
458
DETERMINE COMMONALITY INFORMATION BASED ON PRIORITY INDICATOR WEIGHTS
460
RECOMMENDATION QUEUE AND COMMONALITY INFORMATION
462
ACCEPT/REJECT FRIEND INVITATION
464

FIG. 18

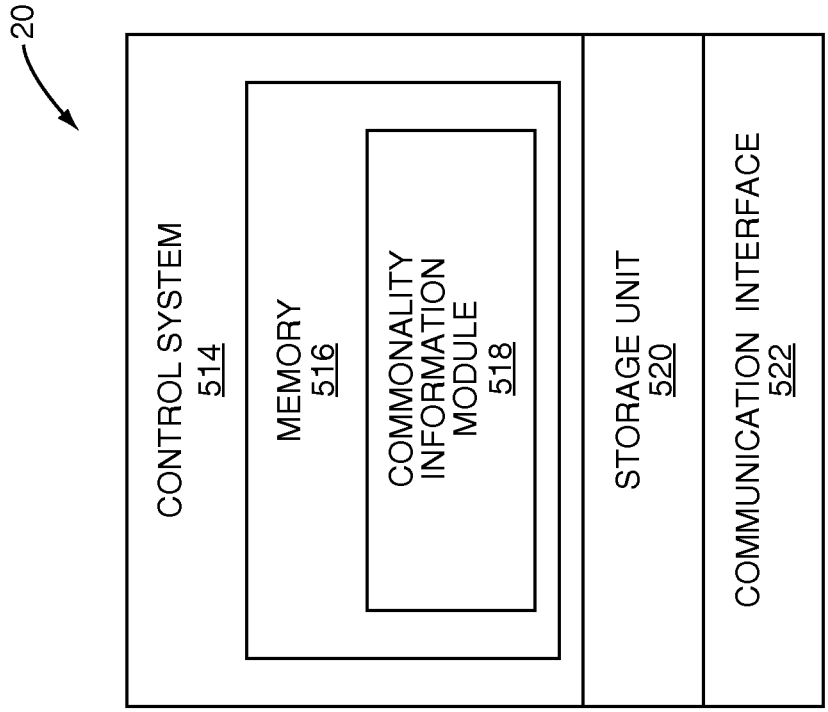

20
CONTROL SYSTEM
514
MEMORY
516
COMMONALITY
INFORMATION
MODULE
518
STORAGE UNIT
520
COMMUNICATION INTERFACE
522

FIG. 20

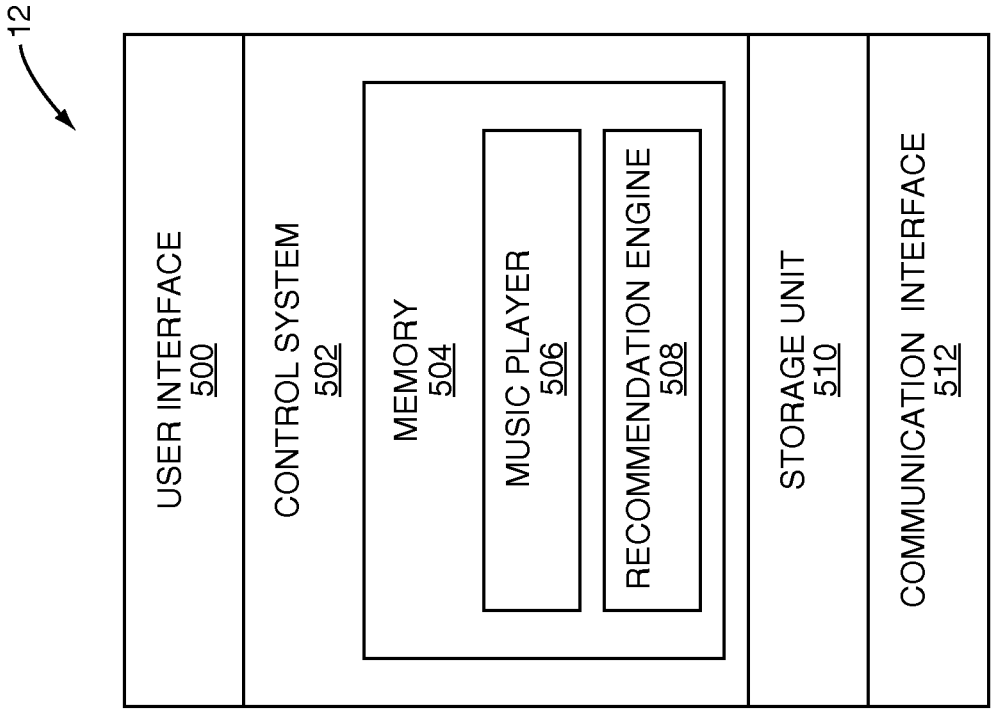

12
USER INTERFACE
500
CONTROL SYSTEM
502
MEMORY
504
MUSIC PLAYER
506
RECOMMENDATION ENGINE
508
STORAGE UNIT
510
COMMUNICATION INTERFACE
512

FIG. 19

METHOD AND SYSTEM FOR PREVIEWING RECOMMENDATION QUEUES

RELATED APPLICATIONS

This application claims the benefit of provisional patent application Ser. No. 61/149,216, filed Feb. 2, 2009, the disclosure of which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

This invention relates to media item recommendation systems, and in particular to previewing a recommendation queue of another user of a media recommendation system.

BACKGROUND OF THE INVENTION

Media item recommendation systems in the context of a social network are known. For example, U.S. Patent Application Publication No. 2008/0016205 A1, which is hereby incorporated by reference herein in its entirety, discloses a recommendation system wherein media item recommendations are automatically generated and sent between devices that are coupled together by virtue of a "friend" status between users of the devices. Each device has an associated recommendation queue that contains media item recommendations. Each device receives media item recommendations from certain devices, and may send recommendations to certain devices. Upon receipt of a media item recommendation, a device prioritizes the media item recommendation according to a plurality of user preferences, or priority indicators, that determine an order in the recommendation queue of the new media item recommendation with respect to the media item recommendations that were already in the recommendation queue. The priority indicators, for example, may be based on metadata associated with a media item, such as a genre of the media item, an artist name associated with the media item, a decade during which the media item was recorded, and the like.

As each device plays a media item, a media item recommendation for the media item is automatically generated by the device and sent to other devices to which the device is coupled. Since a device generates and sends media item recommendations based on the order that media item recommendations are prioritized in the respective recommendation queue, a first user may find it useful to preview a second user's recommendation queue prior to designating the second user a friend in an attempt to discern the type of media item recommendations the first user may expect to receive from the second user. Thus, there is a need for an ability to view a user's recommendation queue prior to designating the user as a friend.

However, because a recommendation queue will change after a media item recommendation is inserted in the recommendation queue, or when the second user alters a weighting of the priority indicators, a snap-shot of a recommendation queue at an instant in time, while helpful, may not provide sufficient information to the first user. Since the second user's recommendation queue is in part based on the media item recommendations generated by those devices to which the second user is coupled, there is a need to determine commonality information as a function of the priority indicators of the second user, and the priority indicators of the devices that provide media item recommendations to the second user. Such commonality information would be useful to the first user in further ascertaining the types of media item recommendations that may be provided to the first user, should the first user designate the second user a friend.

SUMMARY OF THE INVENTION

The present invention relates to a media item recommendation system. User devices that participate in the media item recommendation system may provide media item recommendations to certain user devices, and may receive media item recommendations from certain user devices. Thus, each user device in the media item recommendation system may operate as a media item recommendation receiver and a media item recommendation generator. A user device plays a recommended media item based on an order of media item recommendations in a recommendation queue associated with the user device. Each media item recommendation is an entry in the recommendation queue that identifies a recommended media item. The media item recommendations in a particular recommendation queue are ordered based on priority indicators associated with the respective user device. When a user device selects a media item recommendation from a recommendation queue and plays the recommended media item, a media item recommendation is automatically generated and sent by the user device to certain other user devices to which the user device is coupled. User devices are coupled to one another for the purpose of sending or receiving media item recommendations based on a designation between users associated with the respective user devices. A first user of a first user device may designate a second user of a second user device a friend of the first user. Once designated as a friend, the second user device becomes coupled to the first user device, wherein media item recommendations that are generated by the second user device are provided to the first user device.

In particular, the present invention relates to viewing, sometimes referred to herein as previewing, a portion of a recommendation queue of a second user device. Previewing a recommendation queue of another user device may be useful, for example, in determining whether a first user should designate a second user associated with the second user device a friend of the first user. The present invention also relates to providing commonality information relating to the second user, and to those users that provide the second user media item recommendations, that are indicative of a diversity, or a lack of diversity, of category priority indicator weightings used to prioritize media item recommendations.

The present invention may include a server in communication with one or more user devices. The present invention may be implemented in the context of a social network, where a first user associated with a first user device may choose to designate a second user associated with a second user device a friend of the first user. Prior to doing so, however, the first user may want to preview a portion of the recommendation queue associated with the second user device to ascertain whether the types of media items identified in the recommendation queue of the second user device would be of interest to the first user. The first user device may send a request to the server to obtain a portion of the recommendation queue associated with the second user device. The server may have stored thereon copies of the recommendation queues of the user devices which the server serves. The server may provide recommendation queue entries from a top portion of the recommendation queue of the second user device to the first user device. The first user device can display or otherwise present the queue entries to the first user. The first user can view the recommended media items that are currently in the top portion of

the recommendation queue of the second user device, and determine whether or not to designate the second user a friend of the first user. If the first user designates the second user a friend, the server can couple the first user device to the second user device such that the first user device will receive media item recommendations from the second user device.

According to another embodiment of the present invention, the server does not maintain a copy of each user device's recommendation queue, and upon receipt of the request from the first user device initiates a request to the second user device for queue entries from at least a top portion of the recommendation queue associated with the second user device. The server, upon receipt of the top portion of the recommendation queue from the second user device, can provide the queue entries from the top portion of the recommendation queue to the first user device.

According to yet another embodiment of the present invention, the server may maintain a copy of a second user device's recommendation queue, or a portion of the second user device's recommendation queue, during a period of time when the second user device is offline. Upon the second user device going offline, the second user device can notify the server and provide the server with a copy of the recommendation queue associated with the second user device, or at least the queue entries from a top portion of such recommendation queue. The server may also maintain priority indicators associated with the second user device. Upon receipt of media item recommendations destined for the second user device from other user devices, the server may prioritize each such media item recommendation according to the priority indicators, and insert the media item recommendation in the recommendation queue based on such priority indicators. As such, the server can provide other user devices with information relating to a dynamically changing recommendation queue associated with the second user device, even when the second user device is offline. When the second user device comes online again, the server can synchronize the recommendation queue with the second user device.

According to yet another embodiment, the present invention can determine commonality information, including a commonality measure indicating a diversity, or lack of diversity between category priority indicators used to prioritize media item recommendations. The commonality information can also include identification of categories or subcategories of priority indicators relating to the second user device and any third user devices that provide media item recommendations to the second user device. The commonality information can be provided to the first user device to help the first user ascertain the types of media item recommendations the first user may expect if the first user designates the second user as a friend.

The server may receive a request from the first user device for a portion of the recommendation queue associated with the second user device, and commonality information relating to the second user device and any third user devices that provide media item recommendations to the second user device. Such second and third user devices may be referred to collectively as a recommendation base, because the media item recommendations generated by the second user device are in part based on the media item recommendations received from user devices that send media item recommendations to the second user device. The server maintains a copy of the priority indicators associated with each of the user devices that compose the recommendation base of the second user device. The server can determine a statistical measure of a dispersion of weights associated with the priority indicators associated with each user device in the recommendation base. The statistical measure can be provided to the first user device as an indication of a commonality of category priority weights among the recommendation base. The server can also determine and provide to the first user device commonality information identifying categories or subcategories which the recommendation base collectively rates relatively highly or relatively lowly.

Those skilled in the art will appreciate the scope of the present invention and realize additional aspects thereof after reading the following detailed description of the preferred embodiments in association with the accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

The accompanying drawing figures incorporated in and forming a part of this specification illustrate several aspects of the invention, and together with the description serve to explain the principles of the invention.

FIG. **1** is a block diagram of an exemplary media item recommendation system.

FIG. **2** is an exemplary media item recommendation queue.

FIG. **3** is an exemplary user interface suitable for indicating a priority indicator weight for categories of media items shown in FIG. **2**.

FIG. **4** is an exemplary user interface suitable for indicating a priority indicator weight for the recommender category illustrated in FIG. **3**.

FIG. **5** is an exemplary user interface suitable for indicating a priority indicator weight for the genre category illustrated in FIG. **3**.

FIG. **6** is an exemplary user interface suitable for indicating a priority indicator weight for the decade category illustrated in FIG. **3**.

FIG. **7** is an exemplary user interface suitable for indicating a priority indicator weight for the source category illustrated in FIG. **3**.

FIG. **8** is an exemplary user interface suitable for selecting a user of a media item recommendation system for which a preview of a respective recommendation queue is desired, and an exemplary preview of such recommendation queue.

FIG. **9** is a table illustrating an exemplary category priority indicator weight for a plurality of users that form a recommendation base and a commonality measure associated therewith.

FIG. **10** is an exemplary user interface illustrating a commonality measure and commonality information associated with a recommendation base.

FIG. **11** is a table illustrating an exemplary maximum coefficient of variation possible for the recommendation base associated with FIG. **10**.

FIG. **12** is a table illustrating exemplary priority indicator weights for categories and subcategories of the recommendation base associated with FIG. **10**.

FIG. **13** is an exemplary user interface illustrating a commonality measure and commonality information associated with another recommendation base.

FIG. **14** is a table illustrating exemplary priority indicator weights for categories and subcategories of user devices that form the recommendation base associated with FIG. **13**.

FIG. **15** is a message flow diagram illustrating an exemplary process for previewing a recommendation queue of a user device wherein recommendation queues are maintained on a server.

FIG. **16** is a message flow diagram illustrating a process for previewing a recommendation queue wherein recommendation queues are maintained on a server when a user device is offline.

FIG. **17** is a message flow diagram illustrating a process for previewing a media item recommendation queue for the purpose of blocking a media item recommendation from a user device.

FIG. **18** is a message flow diagram illustrating an exemplary process for previewing a media item recommendation queue in response to an invitation to be designated a friend of another user.

FIG. **19** is a block diagram of an exemplary user device.

FIG. **20** is a block diagram of an exemplary server.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The embodiments set forth below represent the necessary information to enable those skilled in the art to practice the invention and illustrate the best mode of practicing the invention. Upon reading the following description in light of the accompanying drawing figures, those skilled in the art will understand the concepts of the invention and will recognize applications of these concepts not particularly addressed herein. It should be understood that these concepts and applications fall within the scope of the disclosure and the accompanying claims.

The present invention relates to previewing a media item recommendation queue in a media item recommendation system. The present invention may be practiced in any suitable recommendation system wherein user devices automatically provide recommendations to other user devices that are coupled together for such purposes. One such media item recommendation system is disclosed in U.S. Patent Application Publication No. 2008/0016205 A1. For purposes of illustration, aspects of an exemplary media item recommendation system are illustrated in FIG. **1**. While embodiments disclosed herein will discuss media item recommendation systems in the context of music media items, it will be apparent to those skilled in the art that teachings herein are applicable to a variety of media, including audio media items such as songs, video media items such as movies, digital photo media items, text media items such as electronic books, and the like.

An exemplary media item recommendation system **10** includes a plurality of user devices **12**A, **12**B, and **12**C communicatively coupled to one another via a network **14**. Each user device **12**A, **12**B, **12**C includes a respective music player **15**A, **15**B, **15**C for playing songs, a recommendation engine **16**A, **16**B, **16**C for automatically generating media item recommendations, and optionally a music collection **18**A, **18**B, **18**C. Each user device **12**A, **12**B, **12**C may or may not have an associated display device **19**A, **19**B, and **19**C. Throughout the Specification, wherein similar elements are referred to by the same numeric reference characters, and distinguished by alphabetic reference characters, such as the user devices **12**A, **12**B, **12**C, such elements may be referred to collectively with reference only to the numeric reference characters, such as the user devices **12**, where the discussion pertains to one or more of such elements equally. Each user device **12** includes a respective media item recommendation queue **21**A, **21**B, **21**C, which may be maintained in a memory or other electronic storage mechanism by the respective user device **12**, or by a server **20**. The network **14** may comprise any suitable conventional or proprietary network topology and communication technology that enables the user devices **12** and the server **20** to communicate with one another. The user devices **12** can comprise any suitable device capable of communicating with the network **14** and playing media items, such as songs, and can include, for example, a digital music player having a wireless or wired network connection, a computer with suitable communication interfaces and a sound card and speakers connected thereto, a cell phone, and the like.

An individual or entity may establish a user account in the exemplary media item recommendation system **10**. A user account is typically associated with a particular user device **12** during the period of time when the user account is active, or logged in, to the media item recommendation system **10**. Throughout the Specification wherein reference is made to a user, such as one user designating another user a "friend," it is understood that such designation establishes relationships between user accounts, and between user devices **12** in the media item recommendation system **10** that are associated with a respective user account. Associations between user accounts and user devices **12** may be made by virtue of an authentication process carried out manually or automatically by a respective user device **12** that includes credentials known to the respective user, as is known to those skilled in the art. Similarly, data structures and information maintained therein, such as a media item recommendation queue **21**, will be discussed herein in the context of the respective user device **12** with which the data structure is associated, but it will be understood that on a user level, the data structure may be described as being associated with a user. For example, a user account established by a user "Jack" may want to preview a media item recommendation queue **21** associated with a user account established by a user "Jill." As described herein, such media item recommendation queue **21** is implemented in a particular user device **12** that is associated with the user Jill by virtue of an authentication process, or the like.

Users associated with the user devices **12** may designate one another as a "friend." Such designation couples the respective user accounts, and thus respective user devices **12**, together for purposes of automatic media item recommendation generation. For example, assume that a user of the user device **12**A designates a user of the user device **12**B a friend. As the user device **12**B plays a song, the recommendation engine **16**B can automatically generate a media item recommendation for the song and send it to the user device **12**A. The media item recommendation can include metadata identifying information about the song, as well as a link, or unique reference identifier, that the user device **12**A may use to obtain or access the song. The media item recommendation is inserted into the media item recommendation queue **21**A, and the recommended song is played by the music player **15**A when the media item recommendation reaches the top of the media item recommendation queue **21**A. The song may be obtained via any suitable mechanism, such as from a local music collection **18**A, the server **20**, or a subscription music service server **22**, for example.

FIG. **2** illustrates a user interface **24** displaying data associated with an exemplary media item recommendation queue **21** (FIG. **1**). The media item recommendation queue **21** includes a plurality of recommendation queue entries **26-1** through **26**-N. Each recommendation queue entry **26** may include category metadata associated with the recommended song, such as a song name, an artist, a genre, and related information such as the recommender of the song, a source for the song, and the like. All or a portion of the category metadata may not actually be stored in the media item recommendation queue **21**, but rather may be refer-

enced by a song identifier that enables the recommendation engine **16** (FIG. **1**) to obtain the category metadata for purposes of displaying the user interface **24**, or for scoring, as discussed herein. The media item recommendation queue **21** is ordered from top to bottom based on a score associated with each recommendation queue entry **26**. The score may be determined based on priority indicator weights assigned by the respective user to various categories, such as genre, decade, recommender, and source. Thus, the media item recommendation queue **21** may change each time a new media item recommendation is received, or when the user modifies the priority indicator weight assigned to a particular category.

FIG. **3** is an exemplary user interface **28** suitable for assigning a priority indicator weight to categories for purposes of ordering a media item recommendation queue **21**. While four categories, "Genre," "Decade," "Recommender," and "Source" are illustrated, it will be apparent to those skilled in the art that the media item recommendation system **10** could have more, less, or different categories than those illustrated herein. Each category has a respective slider **30** that enables a user to assign a particular priority indicator weight to a respective category. While the user interface **28** uses a range of numbers from 0 to 10 to indicate a respective priority indicator weight, it is apparent that other mechanisms, such as a number of stars and the like, could be used to represent priority indicator weights.

FIG. **4** is an exemplary user interface **32** suitable for assigning a priority indicator weight to the Recommender category. The Recommender category categorizes media item recommendations based on the user associated with the user device **12** that recommended the media item. The user interface **32** enables a user to assign a priority indicator weight to each user that is designated a "friend" of the respective user, and that may consequently provide media item recommendations to the user.

FIG. **5** is an exemplary user interface **34** suitable for assigning a priority indicator weight to the Genre category. The Genre category categorizes media item recommendations based on a genre associated with the recommended media item. For example, for songs, associated genres may include "Alternative," "Classic Rock," "Arena Rock," and the like. The user interface **34** enables a user to assign a priority indicator weight to each genre, and thereby indicate a preference for certain genres over other genres.

FIG. **6** is an exemplary user interface **36** suitable for assigning a priority indicator weight to the Decade category. The Decade category categorizes media item recommendations based on the decade during which the recommended media item was recorded. For example, associated decades may include the "1950s," the "1960s," and the like. The user interface **36** enables a user to assign a priority indicator weight to each decade, and thereby indicate a preference for certain decades over other decades.

FIG. **7** is an exemplary user interface **38** suitable for assigning a priority indicator weight to the Source category. The Source category categorizes media item recommendations based on the source of the physical content referenced by the media item recommendation. For example, sources may be a subscription network to which the respective user subscribes, one or more predetermined online stores from which a recommendation engine **16** may automatically purchase the physical content, or a local storage facility containing the physical content. The user interface **38** enables a user to assign a priority indicator weight to each source, and thereby indicate a preference for certain sources over other sources.

Referring again to FIG. **1**, a first user associated with the user device **12**A may desire to designate a second user associated with the user device **12**C a "friend," or other such analogous designation, suitable to couple the user device **12**C to the user device **12**A wherein the recommendation engine **16**C automatically provides media item recommendations to the user device **12**A. However, because media item recommendations are generated based on the media items played by a respective recommendation engine **16**, the first user may desire to see the media item recommendation queue **21**C associated with the user device **12**C before designating the second user a friend. In particular, the recommendation queue entries from a top portion of the media item recommendation queue **21**C may be particularly useful in providing the first user information about the types of media items that would likely be recommended to the first user should the first user designate the second user as a friend. For example, if the first user does not enjoy the types of songs identified by the recommendation queue entries from the top portion of the media item recommendation queue **21**C, the first user may choose not to designate the second user a friend. While for purposes of illustration a top portion of the media item recommendation queue **21**C is discussed herein, it is apparent that other portions of the media item recommendation queue **21**C may be useful to the first user, such as, for example, a portion of the media item recommendation queue **21**C containing the recommendations added within a predetermined time frame, such as the previous ten minutes.

While the embodiments discussed herein for purposes of illustration are in the context of a first user previewing a media item recommendation queue **21** of a second user for purposes of determining whether or not to designate the second user a friend of the first user, the invention is not limited to previewing media item recommendation queues **21** for this reason. There may be any number of reasons for a first user to preview a media item recommendation queue **21**, including, for example, to decide whether to accept or reject an invitation from the second user asking the first user to be a friend of the second user.

FIG. **8** is an exemplary user interface suitable for enabling a first user to preview a media item recommendation queue **21** associated with one or more second users. FIG. **8** will be discussed in conjunction with FIG. **1**. Assume that a first user associated with the user device **12**A desires to preview a media item recommendation queue **21** associated with another user. A dialog box **40** identifying a plurality of users associated with user accounts in the media item recommendation system **10** may be displayed on the display device **19**A. Assume that the first user selects a user **42**, and that the user **42** is associated with the user device **12**C. The selection of the user **42** by the first user causes the user device **12**A to initiate a request to the server **20**, as described in greater detail herein, to provide the recommendation queue entries from at least a top portion of the media item recommendation queue **21**C. The server **20** may return such recommendation queue entries from the recommendation queue **21**C to the user device **12**A. The user device **12**A formats the recommendation queue entries into a desirable format and displays the information on the display device **19**A in a dialog box **44**. For example, assume that the server **20** returns to the user device **12**A the five recommendation queue entries that were at the top of the media item recommendation queue **21**C at the time of the request. The user device **12**A may format the recommendation queue entries and present them to the first user in an area **46** illustrated in dashed lines. Information from the recommendation queue

entries may include the artist name, the song name, and may include a graphic image of the album cover associated with the songs. The first user may view the area **46** and determine whether or not to designate the user **42** a friend of the first user based on the first user's like or dislike of such songs.

According to another embodiment on the invention, the server **20** may also determine and provide commonality information to the user device **12**A. The commonality information may comprise a commonality measure that indicates a diversity of priority indicator weights of a recommendation base associated with a respective user device **12**. A recommendation base preferably comprises a particular user device **12** for which a media item recommendation preview is desired, and each user device **12** that provides media item recommendations to such respective user device **12**. For example, referring again to FIG. **1**, assume the user device **12**A requests to preview the media item recommendation queue **21**C associated with the user device **12**C. Further, assume at the time of such request, the user associated with the user device **12**C is designated a friend of the user associated with the user device **12**B, such that the user device **12**B provides the user device **12**C media item recommendations. In this example, the recommendation base for the user device **12**C is the user device **12**C and the user device **12**B. According to another embodiment, a recommendation base may comprise only those user devices **12** that provide recommendations to the respective user device **12** of which a media item recommendation preview is desired. For example, in the previous example wherein the user associated with the user device **12**A requests to preview the media item recommendation queue **21**C associated with the user device **12**C, the recommendation base would comprise the user device **12**B and would not include the user device **12**C.

Referring again to FIG. **8**, an exemplary commonality measure **48** is provided in the dialog box **44**. The commonality measure **48** provides a measure of the diversity of priority indicator weights of the recommendation base, which in this example comprises eight user devices **12**, as indicated by a friends value **50** of eight. Thus, the user device **12** associated with the user **42** receives media item recommendations from seven other user devices **12**. Based on the commonality measure **48** of 56% commonality, the first user can determine that the priority indicator weights among this particular recommendation base are fairly diverse. The first user may reasonably conclude from this information that if the first user designates the user **42** a friend of the first user, the user device **12**A will likely receive a fairly diverse assortment of songs.

FIG. **9** is an exemplary table **52** of priority indicator weights associated with a recommendation base and a commonality measure associated therewith. Assume that the recommendation base comprises five user devices **12**A-**12**E, wherein the user devices **12**A-**12**E are associated with users "Hugh," "Gene," "Gary," "Waymen," and "Mike," respectively. A column **54** indicates the categories of the priority indicator weights that will be used in the determination of the commonality measure. While for purposes of illustration only four categories are shown in the table **52**, it is apparent that the teachings disclosed herein could be used to determine a commonality measure based on any number of categories. The numeric values under each user device **12** reflect the priority indicator weight associated with the particular category for that particular user device **12**. For example, the user device **12**A has a priority indicator weight of 7 for the "Decade" category, which indicates that the user Hugh prioritizes the decade in which the song was recorded relatively high. In contrast, the user device **12**C has a priority indicator weight of 2 for the "Decade" category, which indicates that the user Gary prioritizes the decade in which a song was recorded relatively low.

The priority indicator weights associated with each user device **12** may be maintained on the respective user device **12** and obtained from the user device **12** by the server **20** when the server **20** is determining a commonality measure, or may be maintained on the server **20**. One mechanism for determining a commonality measure is via a calculation of a coefficient of variation (CV) of the priority indicator weights of the recommendation base. A CV is a normalized measure of dispersion of a probability distribution, and is defined as the ratio of the standard deviation σ to the mean μ in the following manner:

$$c_v = \frac{\sigma}{\mu}$$

While for purposes of illustration the commonality measure will be discussed in terms of a CV of the priority indicators of the recommendation base, it will be understood that the invention is not limited to calculating a commonality measure using this particular calculation, and that the invention could use a multitude of different commonality measures that indicate a dispersion of the priority indicator weights associated with the recommendation base.

Referring again to FIG. **9**, a mean **56** of the priority indicator weights of the recommendation base of the table **52** is 5.30. A standard deviation **58** of the recommendation base is 1.95. Thus, a CV **60** of the recommendation base is 0.37, or 37%, which indicates a relative lack of dispersion of priority indicator weights among the recommendation base, and which may indicate to a user previewing a media item recommendation queue **21** of one of the user devices **12**A-**12**E that such user device **12** may not be a source of widely diverse song recommendations.

FIG. **10** is an exemplary user interface **61** illustrating commonality information that includes a summary commonality measure for a recommendation base, as well as subcategory penchants of the recommendation base based on subcategory commonality measures. The user interface **61** may be shown on a display device **19** associated with a user device **12**. The user interface **61** may include a commonality value **62** indicating a summary commonality measure associated with the recommendation base. The user interface **61** may also include a count **64** of the number of user devices **12** that make up the respective recommendation base. Category fields **66**, **68**, **70**, and **72** may identify specific categories, and may further identify the subcategories of such categories for which the recommendation base has a penchant based on the subcategory commonality measures associated with the recommendation base. For example, the category field **66** indicates that the recommendation base has a penchant for songs recorded in the 1980s Decade subcategory, the category field **68** indicates that the recommendation base has a penchant for songs in the Rock, Punk, and Pop Genre subcategories, and the category field **70** indicates that the recommendation base has a penchant for songs provided by subscription. The recommendation base had no statistically significant penchant for any particular recommender, as evidenced by the "No Preference" value of the Recommender category field **72**.

Because a coefficient of variation of data is an indication of a dispersion of data, and higher values mean greater

dispersion (e.g., less commonality) while lower values mean less dispersion (e.g., greater commonality), it may be desirable to provide the commonality measure in terms that normalize the commonality measure on a scale of 1% to 100%, with 1% meaning very little commonality, and 100% meaning very much commonality. One mechanism for normalizing a commonality measure is described with reference to the following formulas. Initially, an average category CV is determined for each category in accordance with the following formula:

$$CATEGORY_{CV} = \frac{1}{M} \sum_{K=1}^{SUBCATEGORY\ 1-M} SUBCATEGORY_{CV_K}, \quad (1)$$

wherein $SUBCATEGORY_{CV_K}$ is the average category CV associated with a particular subcategory K of M total subcategories of a respective category.

A summary CV is then determined by averaging the category CVs in accordance with the following formula:

$$CV_{SUMMARY} = \frac{1}{N} \sum_{J=1}^{CATEGORY\ 1-N} CATEGORY_{CV_J}, \quad (2)$$

wherein $CATEGORY_{CV_J}$ is the category CV for a particular category J of N total categories.

A greatest possible CV is then determined for the recommendation base using formulas (1) and (2) based on one user device **12** in the recommendation base having priority indicators at a maximum priority indicator weight, and all other user devices **12** in the recommendation base having priority indicators at a minimum priority indicator weight. A commonality measure (CM) is then determined in accordance with the following formula:

$$CM=1-(CV_{SUMMARY}/CV_{GREATEST\ POSSIBLE}) \quad (3).$$

The CM can be expressed in terms of a fraction, a decimal, or multiplied by 100 and expressed in terms of a percentage.

FIGS. **11** and **12** are exemplary tables of priority indicator weights that may be used to further explain the determination of a normalized commonality measure, as discussed above. FIGS. **11** and **12** contain priority indicator weights used to generate the commonality information provided by the user interface **61** illustrated in FIG. **10**, and thus will be discussed in conjunction with FIG. **10**. Referring first to FIG. **11**, a table **80** illustrates exemplary assumed priority indicator weights suitable for determining a greatest possible CV. Notably, the priority indicator weights associated with one user device **12** are assumed to be a maximum priority indicator weight, and the priority indicator weights associated with all other user devices **12** are assumed to be a minimum priority indicator weight. Such assumptions are used to determine a greatest possible CV for the respective recommendation base. Referring to a decade category **82**, means **84** and standard deviations **86** are calculated for each subcategory in the decade category **82**. Subcategory CVs **88** are then determined based on the respective mean **84** and standard deviation **86** associated with that subcategory. A decade category mean CV **90** is then determined from the subcategory CVs **88**. In similar fashion, a genre category mean CV **92**, a source category mean CV **94**, and a recommender category mean CV **96** are determined. The category mean CVs **90-96** are then averaged to determine a $CV_{GREATEST\ POSSIBLE}$ **98**.

Referring to FIG. **12**, a table **110** illustrates exemplary priority indicator weights for each of the user devices **12** that compose the recommendation base. A CV **112** is determined for each category **114**A-**114**D based on means **116** and standard deviations **118** associated with the category priority indicator weights of the recommendation base. A category mean CV **120** equal to 0.25167 is determined based on the mean of the CVs **112** associated with the categories **114**A-**114**D. Similarly, subcategory CVs **112** are determined for each separate subcategory, and subcategory mean CVs **122**, **124**, **126**, and **128** are determined based on the mean of the subcategory CVs **112** associated with each respective subcategory. A $CV_{SUMMARY}$ **129** is determined based on the mean of the category mean CVs **120**, **122**, **124**, **126**, and **128**. The $CV_{SUMMARY}$ **129** is equal to 0.28421. The CM can then be determined in accordance with formula (3) above using the following values:

CM=(1−(0.28421/2.23607))=0.87

0.87*100=87%.

Thus, the commonality value **62** illustrated in FIG. **10** is 87%, indicating a significant lack of diversity between the recommendation base. The penchants of the recommendation base illustrated in the user interface **61**, such as the penchant of the recommendation base for songs recorded in the 1980s, and for rock, pop, and punk music, may be determined by determining whether certain subcategory CVs of a particular category are relatively higher or relatively lower than other subcategory CVs of the came category. For example, referring again to FIG. **12**, a CV **130** associated with the 1980s subcategory is 0.11111, which is substantially lower than the CVs **112** associated with the other decade subcategories (each of which has a value of 0.3803). Thus, the recommendation base has a penchant for songs categorized in the 1980s subcategory. Similarly, a rock subcategory CV **132** of 0.04563, a punk subcategory CV **134** of 0.04861, and a pop subcategory CV **135** of 0.04563 are substantially lower than the subcategory CVs of the other genre subcategories. Thus, the recommendation base has a penchant for songs in the rock, punk, and pop subcategories. Referring now to the recommender subcategories, a Gene subcategory CV **136** of 0.20328 and a Hugh subcategory CV **138** of 0.20328 are only slightly lower than the other recommender subcategory CUs **112**, and thus a determination may be made that there is no penchant for any particular recommender subcategories. The difference between subcategory CVs sufficient to warrant identification of a penchant may be system dependent.

FIG. **13** illustrates a user interface **150** showing commonality information associated with another exemplary recommendation base. A field **152** indicates that five user devices **12** compose the recommendation base. A field **154** indicates that there is a commonality measure of 65% of the priority indicator weights associated with the recommendation base. A field **156** indicates that there is a penchant for songs among the recommendation base that are recorded in a decade other than the 1980s. A field **158** indicates that there is a penchant among the recommendation base for songs that are of a rap genre. A field **160** indicates that there is a penchant among the recommendation base for songs from a subscription service. A field **162** indicates that there is a penchant among the recommendation base for recommendations from the user Hugh.

FIG. **14** illustrates a table **170** containing priority indicator weights used to determine the commonality information illustrated in FIG. **13**. The commonality information is determined in a similar fashion as that described with respect to FIGS. **11** and **12** and will not be discussed in detail herein. Note that the 1980s subcategory CV **172** of 1.16802, which is substantially greater than the subcategory CVs associated with each other decade subcategory, is the basis for indicating a penchant for music other than the 1980s in the field **156**. Also, note that the 1990s subcategory CV **174** of 0.3803 and the 2000s subcategory CV **176** of 0.3803 might have been used to indicate a penchant for songs categorized in the 1990s subcategory and the 2000s subcategory. Such determination whether to show a penchant for certain types of subcategories or a penchant for subcategories other than a particular type of subcategory is system dependent. From the commonality information illustrated in the user interface **150**, a user may conclude that there is a fair amount of diversity of the recommendation base based on a commonality measure of 65%, and that the recommendation base has a penchant for rap music recorded in a decade other than the 1980s.

FIG. **15** is a message flow diagram illustrating an exemplary process for previewing a media item recommendation queue **21** of a user device **12** wherein media item recommendation queues **21** are maintained on the server **20**. FIG. **15** will be discussed in conjunction with FIG. **1**. Assume that a user associated with the user device **12**A wishes to preview a media item recommendation queue **21**B associated with the user device **12**B. Further assume that the server **20** maintains a copy of at least a top portion of each media item recommendation queue **21** for each user device **12** in the media item recommendation system **10**. The user associated with the user device **12**A selects a user associated with the user device **12**B (step **200**). The user device **12**A initiates a request to the server **20** to preview the media item recommendation queue **21** associated with the user device **12**B (step **202**). The server **20** extracts the recommendation queue entries from a top portion of the media item recommendation queue **21**B associated with the user device **12**B (step **204**).

The server **20** obtains priority indicator weights for the user device **12**B and all other user devices **12** that make up the recommendation base associated with the user device **12**B (step **206**). Such priority indicator weights may be maintained on the server **20** or may be maintained on the respective user devices **12**. Thus, step **206** may include merely obtaining the priority indicator weights from a storage device or memory associated with the server **20**, or may involve separate requests for such priority indicator weights from each user device **12** in the recommendation base. The server **20** uses the priority indicator weights to determine commonality information (step **208**). The server **20** provides the recommendation queue entries and commonality information to the user device **12**A (step **210**). In response to viewing the commonality information, the user may indicate to the user device **12**A that the user desires to designate the user associated with the user device **12**B a friend, which would couple the user device **12**B to the user device **12**A such that the user device **12**B provides media item recommendations to the user device **12**A. The user device **12**A initiates a request to the server **20** to designate the user associated with the user device **12**B a friend of the user associated with the user device **12**A (step **212**).

FIG. **16** is a message flow diagram illustrating a process for previewing a media item recommendation queue **21** wherein media item recommendation queues **21** are maintained on the server **20** when a user device **12** is offline. FIG. **16** will be discussed in conjunction with FIG. **1**. In this embodiment, the media item recommendation queues **21** are normally maintained by the respective user devices **12** while the user device **12** is online. However, prior to going offline, the user device **12**B synchronizes its media item recommendation queue **21**B with the server **20** (step **300**). Synchronization information associated with the user device **12**B synchronizing its media item recommendation queue **21**B with the server **20** can include the recommendation queue entries from the top portion of the media item recommendation queue **21**B, or may comprise the complete media item recommendation queue **21**B. Synchronization may also include priority indicator weights of the user device **12**B. The user device **12**B then goes offline (step **302**). Assume that the user device **12**C is coupled to the user device **12**B such that the user device **12**C automatically provides media item recommendations to the user device **12**B. The user device **12**C provides a media item recommendation to the server **20** that is destined for the user device **12**B (step **304**). The server **20** accesses the user device's **12**B priority indicator weights and determines, based on the priority indicator weights, where in the media item recommendation queue **21**B the media item recommendation should be inserted (step **306**).

Assume that a user associated with the user device **12**A now desires to preview the media item recommendation queue **21**B. The user device **12**A initiates a request to the server **20** to preview the media item recommendation queue **21**B associated with the user device **12**B (step **308**). The server **20** extracts the recommendation queue entries from the top portion of the media item recommendation queue **21**B (step **310**). The server **20** obtains priority indicator weights associated with the user device **12**B and all other user devices **12** making up the recommendation base (step **312**). The server **20** determines commonality information based on the priority indicator weights (step **314**). The server **20** provides the user device **12**A the recommendation queue entries from the top portion of the media item recommendation queue **21**B and the commonality information (step **316**).

While the invention has been described herein in the context of previewing a media item recommendation queue **21** associated with a user device **12** for purposes of determining whether one user should designate another user a friend, there may be many other reasons why a user may wish to preview the media item recommendation queue **21** associated with another user in addition to using such information in determining whether to designate another user as a friend. One such reason may be for the purposes of blocking an impending media item recommendation prior to receiving the media item recommendation.

FIG. **17** is a message flow diagram illustrating a process for previewing a media item recommendation queue **21** for the purpose of blocking a media item recommendation from a user device **12**. Assume that the user associated with the user device **12**B has previously designated the user of the user device **12**A a friend such that the user device **12**A provides media item recommendations to the user device **12**B. The user associated with the user device **12**B desires to see the top portion of the media item recommendation queue **21**A associated with the user device **12**A. The user device **12**B initiates a request to the server **20** to preview the media item recommendation queue **21**A of the user device **12**A (step **400**). In this embodiment, assume that the media item recommendation queues **21** are not maintained on the server **20** but rather are maintained on the individual user devices

12. Thus, the server 20 initiates a request to the user device 12A to provide the server 20 a top portion of the media item recommendation queue 21A (step 402). The user device 12A responds by providing a top portion of the media item recommendation queue 21A to the server 20 (step 404). The server 20 returns the top portion of the media item recommendation queue 21A to the user device 12B (step 406).

The user device 12B may present the top portion of the media item recommendation queue 21A to the user associated with the user device 12B via the display device 19B. The user of the user device 12B may determine they do not desire to receive a media item recommendation at the top of the media item recommendation queue 21A. The user indicates to the user device 12B that they do not with to receive such media item recommendation. The user device 12B initiates a request to the server 20 to block the impending media item recommendation from the user device 12A (step 408). In time, the user device 12A initiates a media item recommendation to the server 20 destined for the user device 12B (step 410). The server 20 blocks the media item recommendation from the user device 12A (step 412). The server 20 may then notify the user device 12A that the media item recommendation was blocked from being sent to the user device 12B (step 414). The server 20 may also notify the user device 12B that the server 20 successfully blocked the media item recommendation from the user device 12A (step 416).

FIG. 18 is a message flow diagram illustrating an exemplary process for previewing a media item recommendation queue 21 of a user device 12 in response to an invitation to be designated a "friend" of the user of the user device 12. FIG. 18 will be discussed in conjunction with FIG. 1. Assume that a user associated with the user device 12B wishes to designate the user associated with the user device 12A a friend, and the user device 12B sends the server 20 such a request (step 450). In turn, the server 20 sends a friend invitation to the user device 12A, indicating to the user device 12A that the user associated with the user device 12B desires to designate the user associated with the user device 12A a friend (step 452). Prior to accepting or rejecting the friend invitation, the user associated with the user device 12A wishes to preview a media item recommendation queue 21B associated with the user device 12B. Assume that the server 20 maintains a copy of at least a top portion of each media item recommendation queue 21 for each user device 12 in the media item recommendation system 10. The user device 12A initiates a request to the server 20 to preview the media item recommendation queue 21B associated with the user device 12B (step 454). The server 20 extracts the recommendation queue entries from a top portion of the media item recommendation queue 21B associated with the user device 12B (step 456).

The server 20 obtains priority indicator weights for the user device 12B and all other user devices 12 that make up the recommendation base associated with the user device 12B (step 458). Such priority indicator weights may be maintained on the server 20 or may be maintained on the respective user devices 12. Thus, step 458 may include merely obtaining the priority indicator weights from a storage device or memory associated with the server 20, or may involve separate requests for such priority indicator weights from each user device 12 in the recommendation base. The server 20 uses the priority indicator weights to determine commonality information (step 460). The server 20 provides the recommendation queue entries and commonality information to the user device 12A (step 462). In response to viewing the commonality information, the user of the user device 12A may indicate to the user device 12A that the user desires to accept the friend invitation, and the user device 12A indicates an acceptance of the friend invitation to the server 20 (step 464). Alternately, the user of the user device 12A may indicate to the user device 12A that the user desires to reject the friend invitation, and the user device 12A indicates a rejection of the friend invitation to the server 20 (step 464). In either event, the server 20 may provide a message to the user device 12B indicating whether the user associated with the user device 12A accepted or rejected the friend invitation.

FIG. 19 is a block diagram of a user device 12 according to one embodiment. The user device 12 may be a particular machine which includes a user interface 500 for displaying and receiving information from a user via a display device 19. The user device 12 may also include a control system 502 that includes a conventional or special purpose processor coupled to a memory 504. The memory 504 may include software instructions suitable for configuring the processor to operate as a music player 506 and software instructions suitable to configure the processor as a recommendation engine 508. The user device 12 may include a storage unit 510 for storing information such as priority indicator weights and media item recommendation queues, and a communication interface 512 for communicating with the network 14.

FIG. 20 is a block diagram of a server 20 according to one embodiment of the invention. The server 20 may be a particular machine that includes a control system 514 that comprises a conventional or proprietary processing device and a memory 516. The memory 516 may include software instructions suitable for configuring the processing device into a commonality information module 518 capable of determining the commonality information such as a commonality measure, and penchants of the recommendation base, as described herein. The server 20 may also include a storage unit 520 for storing data, such as media item recommendation queues or priority indicator weights associated with the user devices 12, and a communication interface 522 for communicating with the network 14.

The functionality described herein with respect to the user device 12 and the server 20 may be implemented on a general purpose processor executing software instructions programmed to provide the described functionality, or may be implemented via firmware, application specific integrated circuits (ASICs), or a combination thereof. Functionality described herein may be implemented via a computer program product comprising a computer usable medium, such as a hard drive, a digital video disc (DVD) or compact disc (CD), or the like, having a computer readable program code suitable for implementing the functionality described herein.

Those skilled in the art will recognize improvements and modifications to the preferred embodiments of the present invention. All such improvements and modifications are considered within the scope of the concepts disclosed herein and the claims that follow.

What is claimed is:

1. A method comprising:

receiving, by a server, a request from a first user device for at least a portion of a media item recommendation queue associated with a second user device;

providing to the first user device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the second user device, wherein an order of the plurality of recommendation queue entries in the media item rec-

ommendation queue is based on a plurality of priority indicators associated with the second user device;

providing to the first user device a commonality measure indicative of a diversity of recommendations associated with the second user device;

receiving a request to couple the second user device to the first user device; and

coupling the second user device to the first user device, wherein media item recommendations generated by the second user device are directed to the first user device.

2. The method of claim **1** further comprising determining a diversity indicator pertaining to a diversity of the plurality of priority indicators associated with the second user device, and a plurality of priority indicators associated with a plurality of third user devices, wherein each third user device generates media item recommendations that are provided to the second user device.

3. The method of claim **2** wherein the diversity indicator is based on a statistical measure of a dispersion of the plurality of priority indicators associated with the second user device and the plurality of priority indicators associated with each of the plurality of third user devices.

4. The method of claim **2** wherein a first plurality of the priority indicators comprise category priority indicators, and wherein the diversity indicator is based on a statistical measure of a dispersion of category priority indicators associated with the second user device and category priority indicators associated with the plurality of third user devices.

5. The method of claim **2** further comprising effecting display of the diversity indicator on a display device associated with the first user device.

6. The method of claim **5** further comprising effecting display of the plurality of recommendation queue entries and the diversity indicator on the display device associated with the first user device.

7. The method of claim **1** further comprising determining a diversity indicator pertaining to a diversity of the plurality of priority indicators associated with a plurality of third user devices, wherein each third user device generates media item recommendations that are provided to the second user device.

8. The method of claim **1** wherein an order of a newly added recommendation queue entry with respect to existing recommendation queue entries in a first media item recommendation queue is based on the plurality of priority indicators associated with the second user device.

9. The method of claim **1** further comprising effecting display of the plurality of recommendation queue entries on a display device associated with the first user device.

10. The method of claim **1** wherein the plurality of recommendation queue entries in the media item recommendation queue associated with the second user device are received by the second user device from a plurality of third user devices, wherein each of the plurality of third user devices provides a recommendation queue entry to the second user device from a media item recommendation queue associated with the respective third user device, and wherein an order of the plurality of recommendation queue entries in the respective media item recommendation queue of each third user device is based on a plurality of priority indicators associated with the respective third user device.

11. The method of claim **1** further comprising sending, by the server, a second request for at least the top portion of the media item recommendation queue associated with the second user device based on the request from the first user device, and receiving the top portion of the media item recommendation queue from the second user device in response to the second request.

12. A method comprising:

receiving, by a server, a request from a first user device for at least a portion of a media item recommendation queue associated with a second user device;

providing to the first user device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the second user device, wherein an order of the plurality of recommendation queue entries in the media item recommendation queue is based on a plurality of priority indicators associated with the second user device;

providing to the first user device a commonality measure indicative of a diversity of recommendations associated with the second user device;

receiving a request from the first user device to inhibit sending the first user device a recommendation based on one of the recommendation queue entries in the top portion of the media item recommendation queue;

receiving the recommendation based on the one of the recommendation queue entries in the top portion of the media item recommendation queue from the second user device destined for the first user device; and

blocking the recommendation from being sent to the first user device.

13. A method comprising:

receiving, by a server, a request from a first user device for at least a portion of a media item recommendation queue associated with a second user device;

providing to the first user device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the second user device, wherein an order of the plurality of recommendation queue entries in the media item recommendation queue is based on a plurality of priority indicators associated with the second user device;

providing to the first user device a commonality measure indicative of a diversity of recommendations associated with the second user device;

receiving a request from the first user device to inhibit sending the first user device a recommendation based on one of the recommendation queue entries in the top portion of the media item recommendation queue;

receiving the recommendation based on the one of the recommendation queue entries in the top portion of the media item recommendation queue from the second user device destined for the first user device;

blocking the recommendation from being sent to the first user device; and

sending to the first user device a notification indicating that the recommendation was blocked.

14. A method comprising:

receiving, by a server, a request from a first user device for at least a portion of a media item recommendation queue associated with a second user device;

providing to the first user device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the second user device, wherein an order of the plurality of recommendation queue entries in the media item recommendation queue is based on a plurality of priority indicators associated with the second user device;

providing to the first user device a commonality measure indicative of a diversity of recommendations associated with the second user device;

receiving a request from the first user device to inhibit sending the first user device a recommendation based on one of the recommendation queue entries in the top portion of the media item recommendation queue;

receiving the recommendation based on the one of the recommendation queue entries in the top portion of the media item recommendation queue from the second user device destined for the first user device;

blocking the recommendation from being sent to the first user device; and

sending to the second user device a notification indicating that the recommendation was blocked.

15. An apparatus comprising:

a communication interface adapted to communicate via a network; and

a control system adapted to:

receive a request from a first user device for at least a portion of a media item recommendation queue associated with a second user device;

provide to the first user device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the second user device, wherein an order of the plurality of recommendation queue entries in the media item recommendation queue is based on a plurality of priority indicators associated with the second user device;

provide to the first user device a commonality measure indicative of a diversity of recommendations associated with the second user device;

receive a request to couple the second user device to the first user device; and

couple the second user device to the first user device, wherein media item recommendations generated by the second user device are directed to the first user device.

16. The apparatus of claim **15** wherein the control system is further adapted to:

determine a diversity indicator pertaining to a diversity of the plurality of priority indicators associated with the second user device and a plurality of priority indicators associated with a plurality of third user devices, wherein each third user device generates media item recommendations that are directed to the second user device.

17. The apparatus of claim **16** wherein the diversity indicator is based on a statistical measure of a dispersion of the plurality of priority indicators associated with the second user device and the plurality of priority indicators associated with each of the plurality of third user devices.

18. The apparatus of claim **15** wherein the control system is further adapted to:

send a second request for at least the top portion of the media item recommendation queue associated with the second user device based on the request from the first user device; and

receive the top portion of the media item recommendation queue from the second user device.

19. A method comprising:

receiving, by a server, a request from a first user device to designate a second user associated with a second user device a friend of a first user associated with the first user device;

providing, by the server, the second user device a message comprising an invitation to designate the second user a friend of the first user;

receiving, by the server, a request from the second user device for at least a portion of a media item recommendation queue associated with the first user device;

providing to the second user device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the first user device, wherein an order of the plurality of recommendation queue entries in the media item recommendation queue is based on a plurality of priority indicators associated with the first user device;

providing to the first user device a commonality measure indicative of a diversity of recommendations associated with the second user device; and

receiving a message from the second user device comprising one of an acceptance message and a rejection message in response to the invitation, and if the message is an acceptance message, coupling the first user device to the second user device, wherein media item recommendations generated by the first user device are directed to the second user device.

20. A method comprising:

receiving, by a server, a request from a first user device for at least a portion of a media item recommendation queue associated with a second user device;

providing to the first user device a plurality of recommendation queue entries from a top portion of the media item recommendation queue associated with the second user device, wherein an order of the plurality of recommendation queue entries in the media item recommendation queue is based on a plurality of priority indicators associated with the second user device;

providing to the first user device a commonality measure indicative of a diversity of recommendations associated with the second user device:

receiving a request to couple the second user device to the first user device wherein the request to couple the second user device to the first user device is based on the plurality of recommendation queue entries; and

coupling the second user device to the first user device, wherein media item recommendations generated by the second user device are directed to the first user device.

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