

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Patent Application of:

CARBUNAR et al.

Application No.: 15/179,765

Filed: June 10, 2016

For: DISTRIBUTED CONTENT
MANAGEMENT

Confirmation No.: 3643

Art unit: 2421

Examiner: MONTOYA, OSCHTA I.

CERTIFICATE OF TRANSMISSION
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RESPONSE TO FINAL OFFICE ACTION
under 37 C.F.R. § 1.116 – Expedited Procedure

Dear Examiner:

In response to the Final Office Action mailed on September 20, 2017 (hereinafter, the “Office action”), Applicant respectfully requests that the Examiner enter the following amendments and consider the following remarks.

Amendments to the Claims are reflected in the listing of claims that begins on page 2 of this paper.

Remarks begin on page 8 of this paper.

Electronic Acknowledgement Receipt

EFS ID:	31049584
Application Number:	15179765
International Application Number:	
Confirmation Number:	3643
Title of Invention:	Distributed Content Management
First Named Inventor/Applicant Name:	Bogdan O. Carbunar
Customer Number:	124235
Filer:	Hang Gao
Filer Authorized By:	
Attorney Docket Number:	25832.1369 (L0700C3)
Receipt Date:	27-NOV-2017
Filing Date:	10-JUN-2016
Time Stamp:	20:51:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		25832_1369_L0700C3_Response.pdf	68832 9b97226a34ed17ce4af4542244bd05833b9dfcb5	yes	12

Multipart Description/PDF files in .zip description			
Document Description		Start	End
Applicant Arguments/Remarks Made in an Amendment		8	12
Claims		2	7
Response After Final Action		1	1

Warnings:

Information:

Total Files Size (in bytes):	68832
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS

Applicant respectfully requests reconsideration of this application in view of the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in substantially the same order in which the corresponding issues were raised in the Office Action.

Summary of Examiner Interview

A telephonic interview was conducted between Examiner Montoya and Applicant's undersigned representative on October 31, 2017. Applicant and the undersigned appreciate the courtesies extended by the Examiner. During the interview, claim 1 was generally discussed. In particular, the Examiner's interpretation of the cited art was discussed. No agreement was reached.

Status of the Claims

Claims 1-20 are pending. No claims are amended, canceled, or added in this paper.

Applicants wish to thank the Examiner for indicating that dependent claims 10, 12-15, and 18 contain allowable subject matter and would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim.

Summary of the Office Action

Claims 1, 3-4, 8-9, 11, 16-17, and 19 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over U.S. Patent Publication No. 2004/0143850 to Costa et al. (hereinafter "Costa") in view of U.S. Patent No. 8,028,319 to Scholl et al. (hereinafter "Scholl").

Claim 2 stands rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Costa and Scholl and further in view of U.S. Patent Publication No. 2004/0103437 to Allegrezza et al. (hereinafter "Allegrezza") and further in view of U.S. Patent No. 8,087,056 to Ryu (hereinafter "Ryu")

Claims 5 and 14 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Costa and Scholl and further in view of U.S. Patent Publication No. 2011/0107030 to Borst et al. (hereinafter "Borst").

Claims 6-7, 13, 15, and 20 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Costa, Scholl, and further in view of U.S. Patent No. 5,956,716 to Kenner et al. (hereinafter “Kenner”).

Response to Rejections under 35 U.S.C. § 103

The Office Action rejected claims 1, 3-4, 8-9, 11, 16-17, and 19 under 35 U.S.C. § 103 as allegedly being unpatentable over Costa in view of Scholl. The Office Action rejected claim 2 under 35 U.S.C. § 103 as allegedly being unpatentable over Costa in view of Scholl and Allegrezza. The Office Action rejected claims 5 and 15 under 35 U.S.C. § 103 as allegedly being unpatentable over over Costa in view of Scholl and Borst. The Office Action rejected claims 6-7, 13, 15, and 20 under 35 U.S.C. § 103 as allegedly being unpatentable over Costa in view of Scholl, Allegrezza, and Kenner. Applicant respectfully requests withdrawal of these rejections because the combination of cited references fails to teach or suggest all of the limitations of the claims.

Claim 1 recites:

A method comprising:
receiving, by a processing apparatus at a first content source, a request for content;
in response to receiving the request, determining that the content is not available from the first content source;
in response to determining that the content is not available from the first content source, determining that a second content source cost associated with retrieving the content from a second content source is less than a third content source cost associated with retrieving the content from a third content source, wherein the second content source cost is determined based on a network impact to fetch the content from the second content source to the first content source, and wherein the third content source cost is determined based on a network impact to fetch the content from the third content source to the first content source; and
in response to determining that the second content source cost is less than the third content source cost, fetching the content from the second content source to the first content source, wherein the first content source, the second content source, and the third content source each maintain a different subset of content available from a master content source. (Emphasis added.)

Obviousness requires that all of the claim features are disclosed by the cited references. The combination of cited references fails to teach or suggest all of the limitations of the claim. In particular, the combination of Costa and Scholl does not teach or suggest “in response to

determining that the second content source cost is less than the third content source cost, fetching the content from the second content source to the first content source,” as recited in claim 1.

The Office action acknowledges that “Costa is silent about in response to determining that the second content source cost is less than the third content source cost, fetching, to the first content source.” (Office action, page 4.) In particular, Costa does not teach or suggest “in response to determining that the second content source cost is less than the third content source cost, fetching the content from the second content source to the first content source,” as recited in claim 1. Nevertheless, the Office action relies on Scholl as allegedly teaching these features. (Office action, pages 2 and 4.) In particular, the Office action states as follows:

Applicant argues that Scholl does not teach “in response to determining that the second content source cost is less than the third content source cost, fetching the content from the second content source to the first content source”. To this matter the examiner respectfully disagrees. Scholl teaches that [sic] an index is search[ed] for viewers watching the content and then ***according to some rules a determination is made***. Finally the content is routed based on the determination (steps 230-248 –figure 2), meeting the claim language. (Office action, page 2; emphasis added.)

However, making a determination “*according to some rules*” does not teach or suggest “in response to determining that the second content source cost is less than the third content source cost, fetching the content from the second content source to the first content source,” as recited in claim 1. In the portions of Scholl referred to in the Office action, Scholl describes a method including the steps of “search[ing] an index for another viewer having the VOD channel content,” “instruct[ing] the edge aggregation device to forward the VOD channel content to the requestor,” determining that “the requestor is below the edge aggregation device,” determining that “the other viewer and the requestor are below a first metro aggregation switch,” determining that “the other viewer is below a first metro aggregation switch and the requestor is below a second metro aggregation switch,” and “subsequently rerout[ing] the VOD channel content to the requestor.” (Scholl, FIG. 2, steps 230-248). Scholl neither teaches nor suggests at least the above-quoted features of claim 1.

Applicant respectfully submits that Borst, Allegrezza, and Kenner are not relied on to teach the above-quoted claim limitations and do not remedy the aforementioned deficiencies of the combination of Costa and Scholl.

Therefore, Applicant respectfully submits that claim 1 is patentable over the combination of the cited references. Claims 9 and 17 recite features similar to these features of claim 1. Applicant respectfully submits that claims 9 and 17 are patentable over the combination of the cited references at least for reasons similar to those discussed above. Given that claims 2-8, 10-16, and 18-20 directly or indirectly depend from the above independent claims, at least for reasons similar to those discussed above, it is respectfully submitted that dependent claims 2-8, 10-16, and 18-20 are patentable over the combination of the cited references.

Accordingly, Applicant respectfully requests that the rejections of claims 1-20 under 35 U.S.C. § 103 and the finality of the Office action be withdrawn.

CONCLUSION

It is respectfully submitted that in view of the amendments and remarks set forth herein, the rejections and objections have been overcome.

If the Examiner determines that prompt allowance of these claims could be facilitated by a telephone conference, the Examiner is invited to contact the undersigned at (973) 597-2500.

Authorization is hereby given to charge Deposit Account No. 50-1358 for any charges that may be due. Furthermore, if an extension is required, then Applicant hereby requests such extension.

Respectfully submitted,

LOWENSTEIN SANDLER LLP

Date: November 27, 2017

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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1. (Previously presented) A method comprising:
 - receiving, by a processing apparatus at a first content source, a request for content;
 - in response to receiving the request, determining that the content is not available from the first content source;
 - in response to determining that the content is not available from the first content source, determining that a second content source cost associated with retrieving the content from a second content source is less than a third content source cost associated with retrieving the content from a third content source, wherein the second content source cost is determined based on a network impact to fetch the content from the second content source to the first content source, and wherein the third content source cost is determined based on a network impact to fetch the content from the third content source to the first content source; and
 - in response to determining that the second content source cost is less than the third content source cost, fetching the content from the second content source to the first content source, wherein the first content source, the second content source, and the third content source each maintain a different subset of content available from a master content source.
2. (Previously presented) The method of claim 1, further comprising:
 - determining that there is not sufficient memory to cache the content at the first content source; and
 - selecting one or more items to evict from a cache at the first content source to make available sufficient memory for the content, wherein the selection of the items to evict minimizes a network penalty associated with the eviction of the items, wherein the network penalty is based on sizes of the content and the items, and numbers of requests expected to be received for the content and the items.

3. (Previously presented) The method of claim 1, wherein the second content source cost is determined further based on traffic which is predicted to occur over a link in a network path from the second content source to the first content source while fetching of the content occurs, and wherein the third content source cost is determined further based on traffic which is predicted to occur over a link in a network path from the third content source to the first content source while fetching of the content occurs.

4. (Original) The method of claim 1, wherein the first content source comprises a first server, the second content source comprises a second server, the third content source comprises a third server, and the master content source comprises a master server.

5. (Previously presented) The method of claim 1, wherein the second content source cost is determined further based on a number of items simultaneously transferred over a link in a network path from the second content source to the first content source, and wherein the third content source cost is determined further based on a number of items simultaneously transferred over a link in a network path from the third content source to the first content source:

6. (Previously presented) The method of claim 1, wherein the second content source cost is determined further based on using historical traffic data to predict traffic for a target fetch time for the content over a network path from the second content source to the first content source, and wherein the third content source cost is determined further based on using historical traffic data to predict traffic for a target fetch time for the content over a network path from the third content source to the first content source.

7. (Previously presented) The method of claim 1, wherein the second content source cost is determined further based on second predicted traffic for one or more specific time intervals during a day over a second network path from the second content source to the first content source, wherein the second predicted traffic is based on an analysis of repetitive traffic patterns over the second network path, wherein the third content source cost is determined further based on third predicted traffic for one or more specific time intervals during a day over a third network path from the third content source to the first content source, and wherein the third predicted traffic is based on an analysis of repetitive traffic patterns over the third network path.

8. (Original) The method of claim 1, wherein the first content source is a first video home office (VHO), the second content source is a second VHO, and the third content source is a third VHO, wherein the master content source is a video service office (VSO).

9. (Previously presented) A non-transitory computer-readable medium comprising instructions that, when executed by a processing apparatus, cause the processing apparatus to:
receive, by the processing apparatus, a request for content to be delivered from a first content source;

in response to the receipt of the request, determine that the content is not available from the first content source;

in response to the determination that the content is not available from the first content source, determine that a second content source cost associated with retrieving the content from a second content source is less than a third content source cost associated with retrieving the content from a third content source, wherein the second content source cost is determined based on a network impact to fetch the content from the second content source to the first content source, and wherein the third content source cost is determined based on a network impact to fetch the content from the third content source to the first content source; and

in response to the determination that the second content source cost is less than the third content source cost, fetch the content from the second content source to the first content source, wherein the first content source, the second content source, and the third content source each maintain a different subset of content available from a master content source.

10. (Previously presented) The non-transitory computer-readable medium of claim 9, wherein the instructions are further to cause the processing apparatus to:

determine that there is not sufficient memory to cache the content at the first content source; and

select one or more items to evict from a cache at the first content source to make available sufficient memory for the content, wherein the selection of the items to evict minimizes a network penalty associated with the eviction of the items, wherein the network penalty is based on sizes of the content and the items, numbers of requests expected to be received for the content and the items, and fetch costs associated with retrieval of the content and the items, wherein each of the fetch costs is based on a sum of link weights of links in a network path for fetching each of

the content and the items, and wherein each of the link weights is based on traffic predicted on a link in the links of the network path.

11. (Previously presented) The non-transitory computer-readable medium of claim 9, wherein the instructions are further to cause the processing apparatus to:

determine a stream cost associated with streaming the content from a content source other than the first content source to fulfill the request for the content; and

in response to a determination that the stream cost is less than a cost to cache the content to the first content source, stream the content from the second content source.

12. (Previously presented) The non-transitory computer-readable medium of claim 9, wherein the second content source cost is determined further based on traffic which is predicted to occur over a most utilized link in a network path from the second content source to the first content source while the fetch of the content occurs, and wherein the third content source cost is determined further based on traffic which is predicted to occur over a most utilized link in a network path from the third content source to the first content source while the fetch of the content occurs.

13. (Previously presented) The non-transitory computer-readable medium of claim 12, wherein the second content source cost is determined further based on historical traffic data in a network path from the second content source to the first content source, and wherein the third content source cost is determined further based on historical traffic data in a network path from the third content source to the first content source.

14. (Previously presented) The non-transitory computer-readable medium of claim 12, wherein the second content source cost is determined further based on a number of items simultaneously transferred over a link in a network path from the second content source to the first content source, and wherein the third content source cost is determined further based on a number of items simultaneously transferred over a link in a network path from the third content source to the first content source.

15. (Previously presented) The non-transitory computer-readable medium of claim 12, wherein the second content source cost is determined further based on second predicted traffic

for one or more specific time intervals during a day over a second network path from the second content source to the first content source, wherein the second predicted traffic is based on an analysis of repetitive traffic patterns over the second network path, wherein the third content source cost is determined further based on third predicted traffic for one or more specific time intervals during a day over a third network path from the third content source to the first content source, and wherein the third predicted traffic is based on an analysis of repetitive traffic patterns over the third network path.

16. (Original) The non-transitory computer-readable medium of claim 9, wherein the first content source is a first distributed storage component, the second content source is a second distributed storage component, and the third content source is a third distributed storage component, wherein the master content source is a central repository.

17. (Previously presented) A system for a first server comprising:

a storage; and

a processing apparatus, coupled to the storage, configured to execute instructions to:

receive a request for content from a client device;

in response to the receipt of the request, determine that the content is not stored by the storage;

in response to the determination that the content is not stored by the storage, determine that a second server cost associated with retrieving the content from a second server is less than a third server cost associated with retrieving the content from a third server, wherein the second server cost is determined based on a network impact to fetch the content from the second server to the first server, and wherein the third server cost is determined based on a network impact to fetch the content from the third server to the first server; and

in response to the determination that the second server cost is less than the third server cost, fetch, by the first server, the content from the second server, wherein the first server, the second server, and the third server each maintain a different subset of content available from a master server.

18. (Previously presented) The system of claim 17, wherein the processing apparatus is further to execute the instructions to:

determine that the storage is insufficient to cache the content at the first server; and

select one or more items to evict from a cache at the first server to make available sufficient space on the storage for the content, wherein the selection of the items to evict minimizes a network penalty associated with the eviction of the items, wherein the network penalty is based on sizes of the content and the items, numbers of requests expected to be received for the content and the items, and fetch costs associated with retrieval of the content and the items, wherein each of the fetch costs is based on a sum of link weights of links in a network path for fetching each of the content and the items, and wherein each of the link weights is based on traffic predicted on a link in the links of the network path.

19. (Previously presented) The system of claim 17, wherein the processing apparatus is further to execute the instructions to:

determine a stream cost associated with streaming the content from a server other than the first server to fulfill the request for the content; and

in response to a determination that the stream cost is less than a cost to cache the content to the first server, stream the content to fulfill the request for the content.

20. (Previously presented) The system of claim 17, wherein the second server cost is determined further based on historical traffic data and predicted traffic over a network path from the second server to the first server, and wherein the third server cost is determined further based on historical traffic data and predicted traffic over a network path from the third server to the first server.