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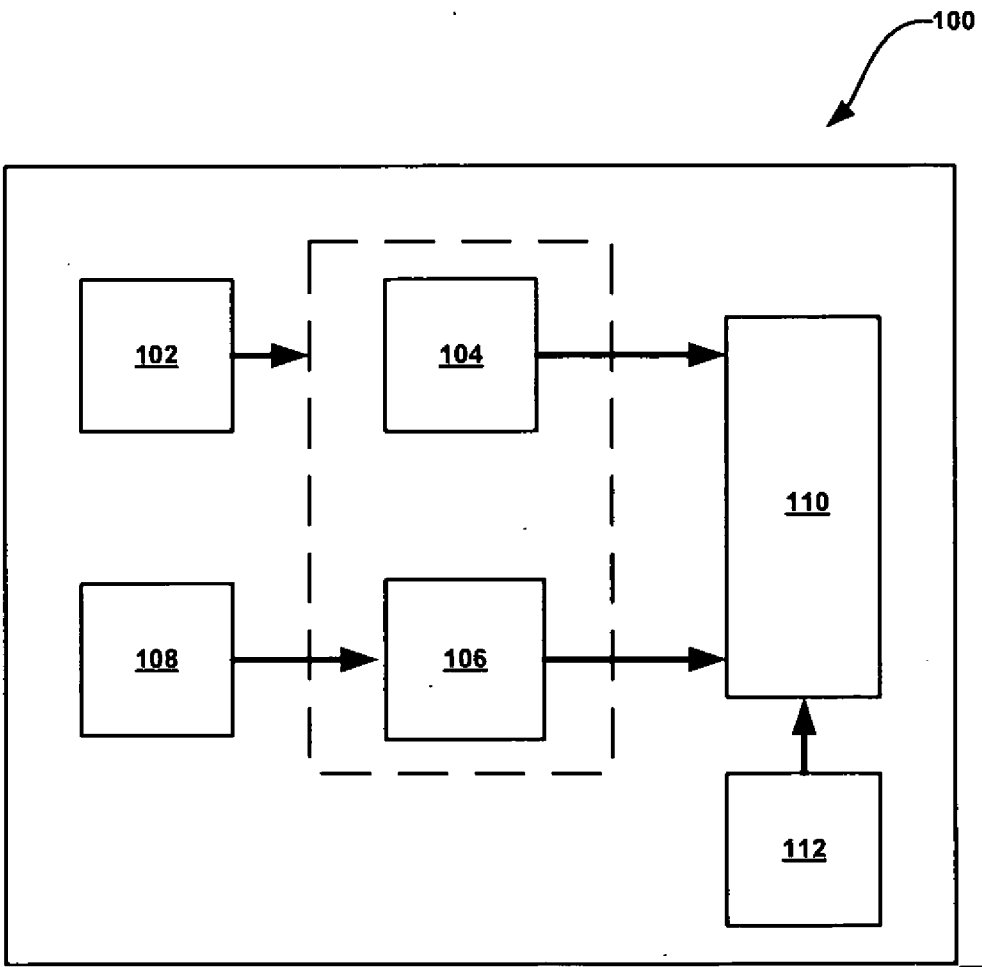
(54) Title: A SYSTEM AND METHOD FOR CONTROLLING SECONDARY WINDOWS IN SMART DEVICES

(57) Abstract: The invention relates to a method and system for displaying content on a display device. A primary content is displayed in primary window and secondary content is displayed in background of the primary window. A user selects a region of interest (ROI) in the secondary content and only the selected ROI is displayed in the secondary window. The secondary window is smaller in size than the primary window. The user is able to control the content in the primary and secondary windows by the control features provided in the respective windows. The number of primary and secondary windows presented on the display device depends on the number of display surfaces supported by the display device.

## ABSTRACT

**A System and Method for Controlling Secondary Windows in Smart Devices**

The invention relates to a method and system for displaying content on a display device. A primary content is displayed in primary window and secondary content is displayed in background of the primary window. A user selects a region of interest (ROI) in the secondary content and only the selected ROI is displayed in the secondary window. The secondary window is smaller in size than the primary window. The user is able to control the content in the primary and secondary windows by the control features provided in the respective windows. The number of primary and secondary windows presented on the display device depends on the number of display surfaces supported by the display device.



We Claim:

1. A system for displaying content on a display device, the system comprising:

one or more processors configured to provide:

a display surface component configured to handle a plurality of windows presented on the display device wherein the plurality of windows presented being based on number of display surfaces supported by the display device;

a first window component configured to display a primary content of a primary application in a first window;

a second window component configured to display one or more secondary content from corresponding secondary applications in a plurality of secondary windows;

an input component configured to receive a secondary content selection on the plurality of secondary windows;

a presentation component configured to simultaneously present the selected secondary content and the primary content; and

a control component configured to manage one or more control features of the primary or secondary content.

2. The system as claimed in claim 1, wherein the display device is a smart device.

3. The system as claimed in claim 1, wherein the secondary content selection is by input device.

4. The system as claimed in claim 3, wherein the input device is one from the group including a stylus, touchpad, mouse, trackball and joystick.

5. The system as claimed in claim 1, wherein the primary and secondary content are from the group including audio, video, text and visual content.

6. The system as claimed in claim 1, wherein the secondary content selection corresponds to a region of interest to a user.

7. The system as claimed in claim 1, wherein the control component is configured to manage audio features in primary or secondary content.

8. The system as claimed in claim 1, wherein the control component is configured to manage video features in primary or secondary content.

9. The system as claimed in claim 1, wherein the size of each of the plurality of secondary windows is smaller than the first window.

10. The system as claimed in claim 8, wherein the secondary window size is controlled by a user.

Dated this 20th day of June 2017

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## FIELD OF INVENTION

The invention relates to visual displays and, more particularly, to controlling secondary windows in smart devices.

## BACKGROUND

Smart device users often work on multiple applications at the same time. For instance, consider a user working on multiple applications in a smartphone. Generally, the application content that is of prime interest to the user is displayed in the main window and any other application content in which user is interested in but not of his prime interest, is displayed in secondary window. Usually, the whole of the application content that is associated with secondary window, hereinafter, secondary content, is displayed in the secondary window. However, the user is keen in viewing only a portion of the secondary content that is of interest to the user (i.e., a Region of Interest (ROI)). For example, the user may be interested in a sports score, not the complete sports broadcast. When the whole of the secondary content is visible in the secondary window, the ROI to the user (i.e. sports score) gets squeezed to an extent that it becomes unreadable or very difficult to read. Thus, there is a need for a system and method that allows the user to specify a ROI in the secondary content and displays only the ROI in the secondary window. Further, there may be a need for displaying ROI from different applications in corresponding secondary windows. Also, if the user is viewing multimedia content, then there is a need for a control mechanism to control the audio or video features of multimedia content displayed in the main window and secondary windows.

The present invention is directed to overcoming one or more of the problems as set forth above.

## SUMMARY OF THE INVENTION

Exemplary embodiments of the invention disclose a method and system for displaying content on a display device. According to an exemplary embodiment, the disclosed method and system handles a plurality of windows presented on the display device wherein the plurality of windows presented are based on number of display surfaces supported by the display device. According to an embodiment, a primary content of a primary application is displayed in a first window. One or more secondary content from corresponding secondary applications is displayed in a plurality of secondary windows. A secondary content selection on the plurality of secondary windows is received. According to an exemplary embodiment, the disclosed method and system simultaneously presents the selected secondary content and the primary content on the display device. Further, the disclosed method and system manages one or more control features of the primary or secondary content.

## BRIEF DESCRIPTION OF DRAWINGS

Other objects, features, and advantages of the invention will be apparent from the following description when read with reference to the accompanying drawings. In the drawings, wherein like reference numerals denote corresponding parts throughout the several views:

Figure 1 illustrates a system for displaying content on a display device, according to an exemplary embodiment of the invention;

Figure 2 illustrates a block diagram of a process for displaying content on a display device, according to an exemplary embodiment of the invention; and

Figure 3 illustrates a visual display showing multiple secondary windows on a primary window.

## DETAILED DESCRIPTION OF DRAWINGS

The following description with reference to the accompanying drawings is provided to assist in a comprehensive understanding of exemplary embodiments of the invention. It includes various specific details to assist in that understanding but these are to be regarded as merely exemplary. Accordingly, those of ordinary skill in the art will recognize that various changes and modifications of the embodiments described herein can be made without departing from the scope and spirit of the invention. In addition, descriptions of well-known functions and constructions are omitted for clarity and conciseness.

According to embodiments of the invention, a system and method for displaying content on a display device is disclosed.

Figure 1 illustrates an exemplary system 100 for displaying content on a display device, according to an embodiment of the invention. According to an embodiment, the display device may be a smart device. According to an exemplary embodiment, the smart device may be a smartphone, tablet, smart TV or an automotive dashboard. According to one embodiment, the display device may be any display such as, but not limited to, Cathode ray tube display (CRT), Light-emitting diode display (LED), Electro-luminescent display (ELD), Plasma display panel (PDP) etc. According to another embodiment, the display may include a graphical user interface (GUI).

The disclosed system 100 may include one or more processors configured to provide a display surface component 102, a first window component104, a second window component 106, an input component 108, a presentation component 110 and a control component 112. According to an embodiment, the one or more processors may correspond to a microcontroller.

The display surface component 102 may handle a plurality of windows presented on the display device. The plurality of windows presented may be based on number of display surfaces supported by the display device.

The first window component 104 may display a primary content of a primary application in a first window. According to an embodiment, the primary content may be audio, video, text or visual content. According to an exemplary embodiment, the primary application may be any application such as, but not limited to, a word application, a media player, a mail application, a chat application etc. According to an embodiment, a window in which primary application is running may be the first window. According to another embodiment, the home screen may be the first window.

The second window component 106 may display one or more secondary content from corresponding secondary applications in a plurality of secondary windows. In other words, the second window component 106 may control the display of one or more secondary content from corresponding secondary applications in a plurality of secondary windows. According to an embodiment, the secondary applications may run in background of the primary application. According to another embodiment, the number of secondary windows may be based on the number of display surfaces supported by the display device. According to an exemplary embodiment, the secondary application may be any application such as, but not limited to,

sports, movie, news, chat etc. According to an embodiment, the secondary content may be audio, video, text or visual content. According to an embodiment, the size of each of the plurality of secondary windows may be smaller than the first window. According to another embodiment, the size of the secondary windows may be controlled by a user.

The input component 108 may receive a secondary content selection on the plurality of secondary windows. According to an embodiment, the secondary content may be selected by an input device. According to an exemplary embodiment, the input device may be one from the group including a stylus, touch pad, mouse, trackball and joystick. According to an embodiment, the secondary content selection may correspond to a region of interest (ROI) to a user. According to an embodiment, the user may define the ROI as a rectangular area on the secondary window. According to another embodiment, the ROI may be defined by any arbitrary shape such as, but not limited to, square, circle, polygon etc. According to an exemplary embodiment, an L shaped input may be used to select the ROI. According to another embodiment, a gesture input may be provided to define the ROI.

According to an embodiment, a user may have an option to select multiple ROIs for a secondary content. According to another embodiment, the user may select ROIs from a plurality of secondary content from corresponding secondary applications. The selected ROIs from the plurality of secondary content may be displayed in the plurality of secondary windows. According to an exemplary embodiment, the size of each of the plurality of secondary windows may be based on the corresponding ROIs selected by the user.

The presentation component 110 may simultaneously present the selected secondary content and the primary content. According to an embodiment, the selected secondary content may be

displayed in the secondary window and superimposed on the primary content in the first window. According to another embodiment, the position of the secondary window on the first window may be predefined or specified by a user. According to an exemplary embodiment, the secondary window may be displayed on the upper right corner of the display device.

According to another embodiment, the secondary content may be selected from a plurality of secondary applications and accordingly secondary content in respective secondary windows may be superimposed on the primary content in the first window. According to an embodiment, the secondary content selection from the plurality of secondary applications may be performed by selecting secondary content from one secondary application at a time.

The control component 112 may be configured to manage one or more control features of the primary or secondary content. According to an embodiment, the control component may be configured to manage audio features in the primary or secondary content. According to an exemplary embodiment, the audio features such as, but not limited to, mute, increasing or decreasing volume and fast forward or rewind the audio content may be controlled. According to another embodiment, the control component may be configured to manage video features in the primary or secondary content. According to an exemplary embodiment, the video features such as, but not limited to, seek, pause and fast forward or rewind the video content may be controlled. According to yet another embodiment, the control component may be configured to manage multimedia content displayed in the primary or secondary windows.

Figure 2 illustrates a block diagram of the process 200 for displaying content on a display device, according to an embodiment of the invention. The process 200 may present a plurality

of windows on the display device based on number of display surfaces supported by the display device.

At step 202, a primary content of a primary application may be displayed in a first window. According to an embodiment, the primary content may be audio, video, text or visual content.

At step 204, secondary content from one or more secondary applications may be displayed in corresponding one or more secondary windows. According to an embodiment, the secondary content may be audio, video, text or visual content.

At step 206, secondary content selection may be received on the secondary windows. According to an embodiment, the secondary content may be selected by an input device. According to an exemplary embodiment, the input device may be one from the group including a stylus, touch pad, mouse, trackball or joystick. According to an embodiment, the secondary content selection may correspond to a region of interest (ROI) to a user.

At step 208, the selected secondary content and the primary content may be simultaneously presented on the display device. According to an embodiment, the selected secondary content may be displayed in the secondary window and superimposed on the primary content in the first window.

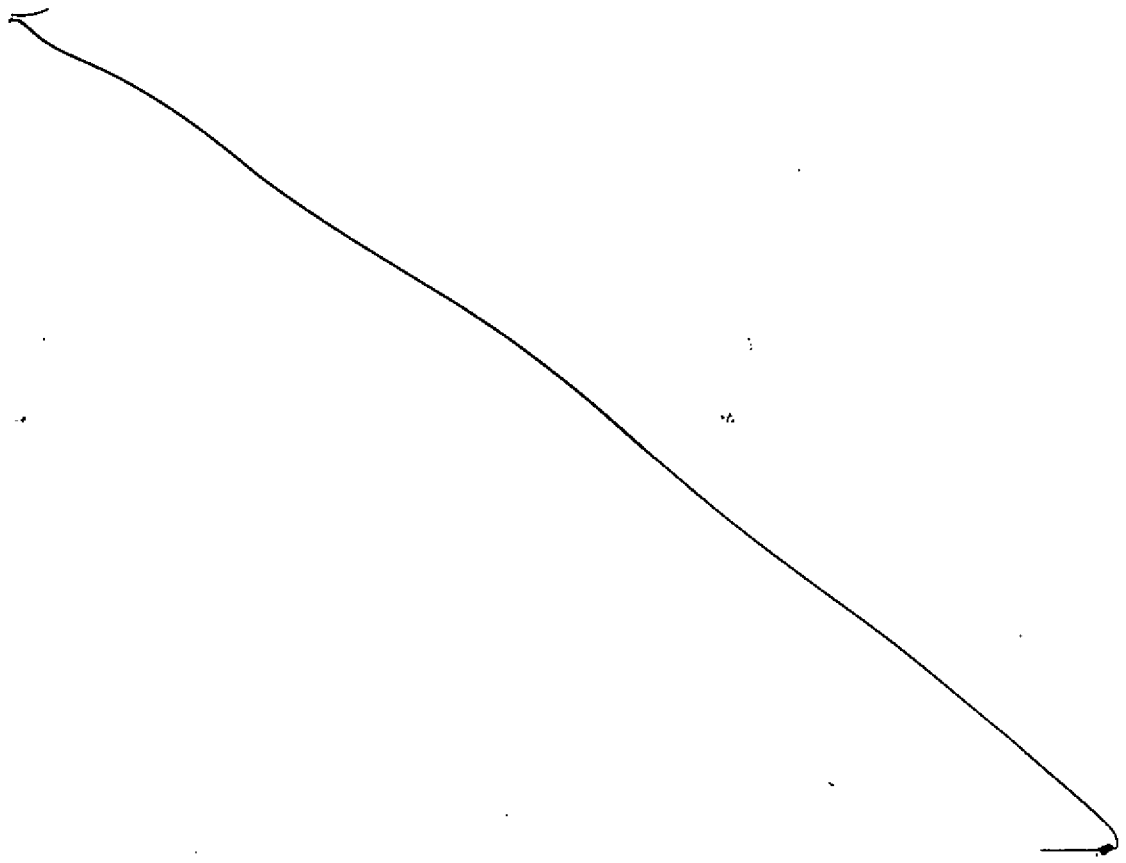
At step 210, the control features of the primary and secondary content may be managed. According to an embodiment, audio features in the primary or secondary content may be controlled by user. According to another embodiment, video features in the primary or secondary content may be controlled by the user.

Figure 3 illustrates a visual display showing multiple secondary windows on a primary window. Figure 3 illustrates a visual display 300 showing a primary window 302 and multiple secondary windows 304, 306 and 308. The primary window 302 may display a primary content from a primary application and secondary windows 304, 306 and 308 may display secondary content from corresponding secondary applications. According to an exemplary embodiment, the primary window 302 may display a multimedia content. According to another exemplary embodiment, the secondary window 304 may display an audio content, the secondary window 306 may display a video content and the secondary window 308 may display a sports score. According to an embodiment, there may be separate controls available to a user for controlling the content in primary and secondary windows. According to an exemplary embodiment, the multimedia content in primary window 302 may be controlled using control features for multimedia content, the audio content in secondary window 304 may be controlled using audio controls and the video content in secondary window 306 may be controlled using video controls. According to an exemplary embodiment, the user may control the multimedia content in primary window 302 by fast forwarding the content and control the audio content in secondary window 304 by increasing the volume of the audio content.

In the drawings and specification there has been set forth preferred embodiments of the invention, and although specific terms are employed, these are used in a generic and descriptive sense only and not for purposes of limitation. Changes in the form and the proportion of parts, as well as in the substitution of equivalents, are contemplated as circumstances may suggest or render expedient without departing from the spirit or scope of the invention.

Throughout the various contexts described in this disclosure, the embodiments of the invention further encompass computer apparatus, computing systems and machine-readable media configured to carry out the foregoing systems and methods. In addition to an embodiment consisting of specifically designed integrated circuits or other electronics, the present invention may be conveniently implemented using a conventional general purpose or a specialized digital computer or microprocessor programmed according to the teachings of the present disclosure, as will be apparent to those skilled in the computer art.

Appropriate software coding can readily be prepared by skilled programmers based on the teachings of the present disclosure, as will be apparent to those skilled in the software art. The invention may also be implemented by the preparation of application specific integrated circuits or by interconnecting an appropriate network of conventional component circuits, as will be readily apparent to those skilled in the art.



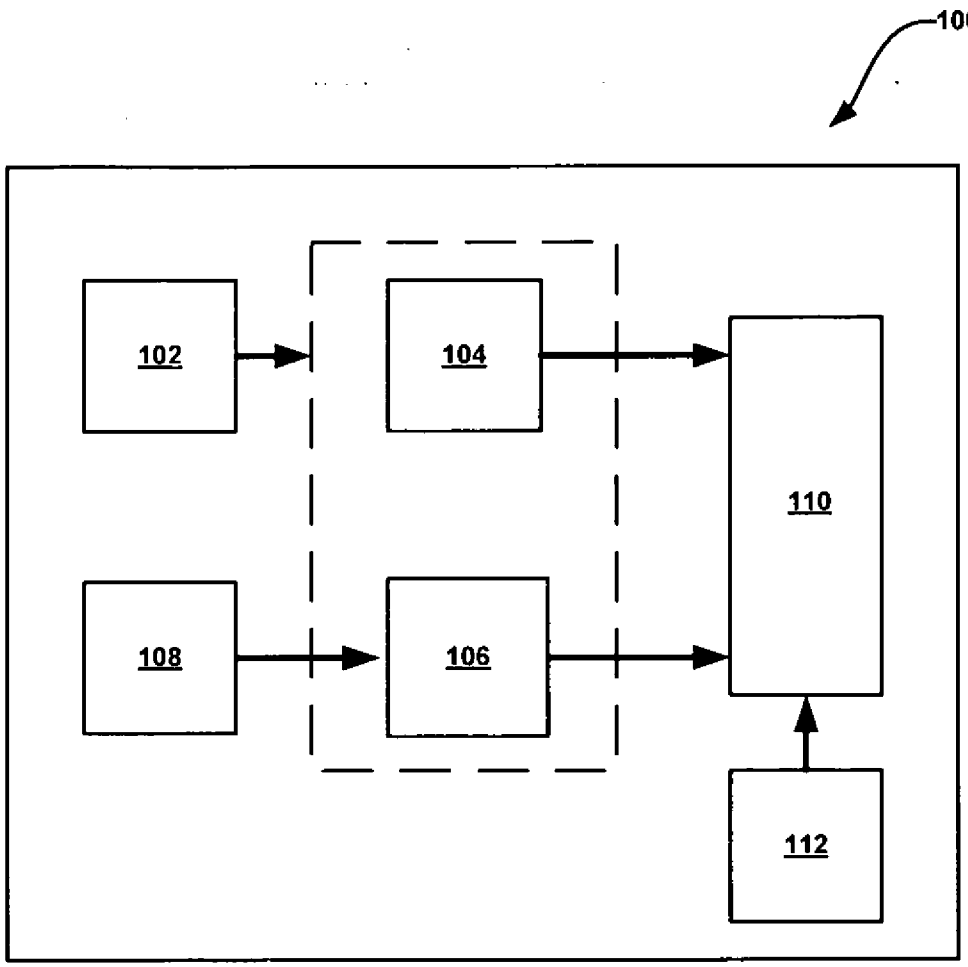



Figure 1

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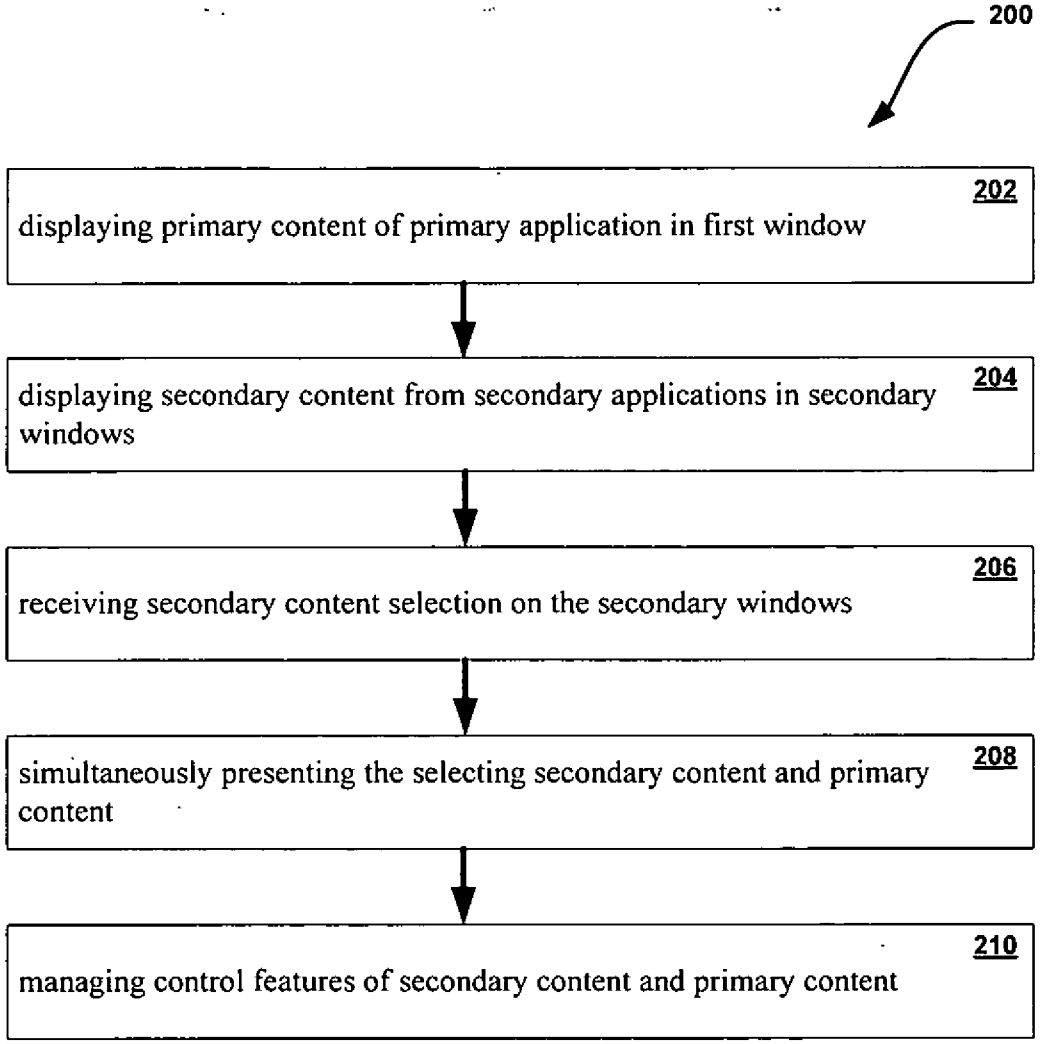


Figure 2

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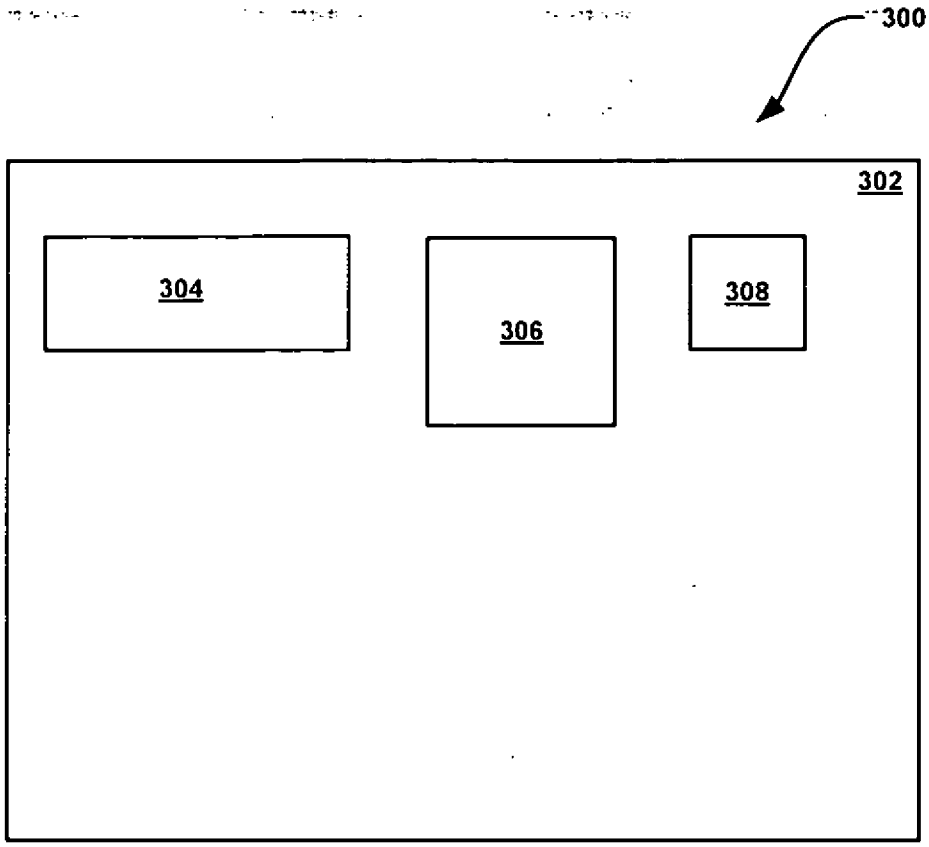


Figure 3

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