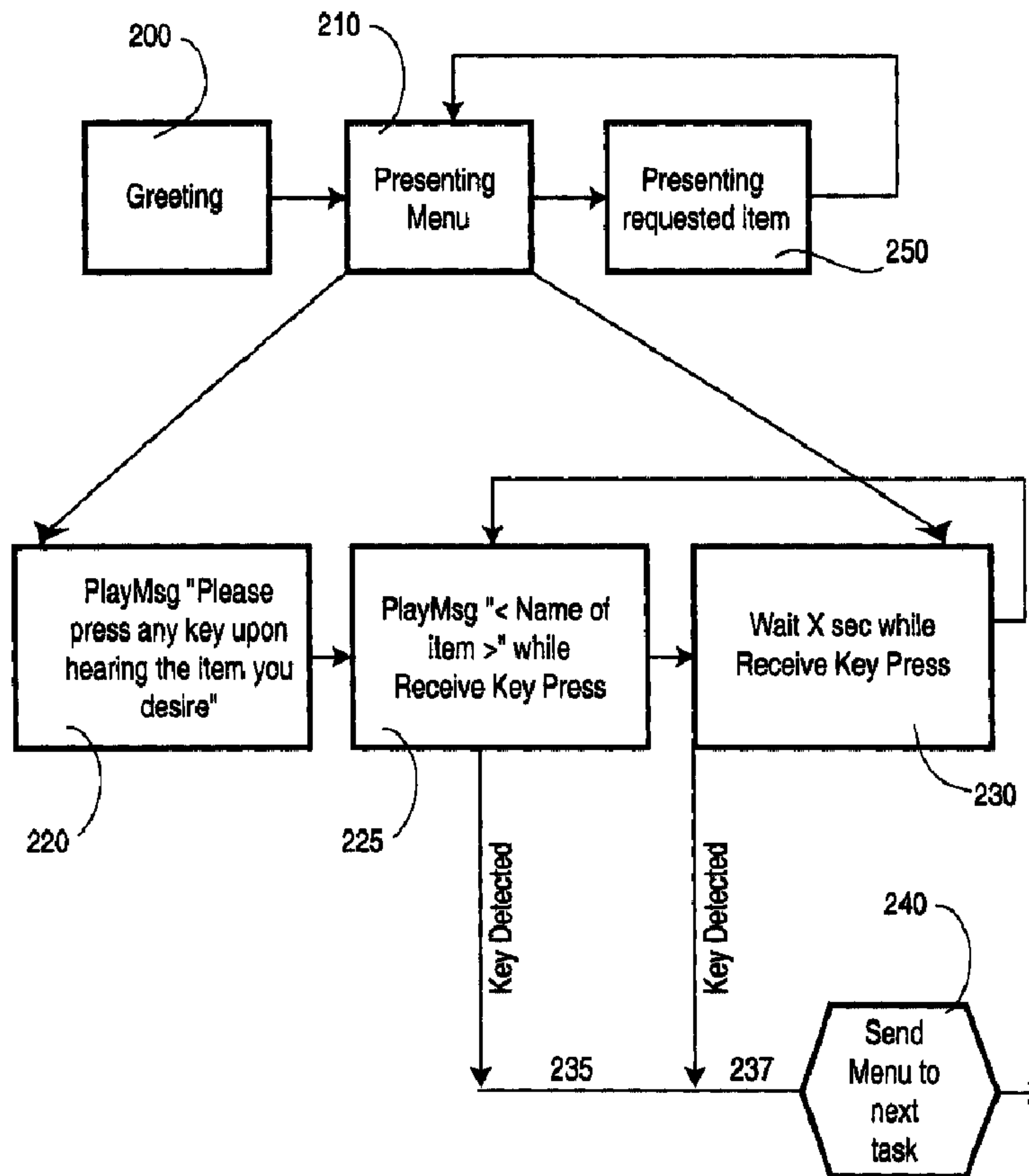




(22) Date de dépôt/Filing Date: 2002/08/29  
 (41) Mise à la disp. pub./Open to Public Insp.: 2003/02/28  
 (45) Date de délivrance/Issue Date: 2007/01/09  
 (30) Priorité/Priority: 2001/08/31 (GB0121150.7)

(51) Cl.Int./Int.Cl. *H04M 3/493* (2006.01),  
*H04Q 1/45* (2006.01)  
 (72) Inventeur/Inventor:  
VU, HUY, CA  
 (73) Propriétaire/Owner:  
MITEL NETWORKS CORPORATION, CA  
 (74) Agent: PERRY + PARTNERS

(54) Titre : SYSTEME DE PRESENTATION DE MENU  
 (54) Title: MENU PRESENTATION SYSTEM



(57) Abrégé/Abstract:

A method of presenting an item from a menu of an IVR system for selection is provided, comprising presenting the item to a caller, presenting an audio space to the caller, and detecting any of a number of inputs from an input device during the presentation of the item and the audio space to indicate the selection of the item by the caller.

Abstract

A method of presenting an item from a menu of an IVR system for selection is provided, comprising presenting the item to a caller, presenting an audio space to the caller, and detecting any of a number of inputs from an input device during the presentation of the item and the audio space to indicate the selection of the item by the caller.

## MENU PRESENTATION SYSTEM

### Field of Invention

This invention relates to Interactive Voice Response (IVR) systems and in particular to a method of presenting menus to users of IVR systems including presentation of audio formatted Web pages.

### Background of the Invention

IVR systems have been used to interact with callers for various purposes. Most IVR systems present a menu of items for a caller to pick an item. The menu is presented as a sequence of audio messages to the caller. Typically, the caller presses the keys of a telephone, or other input device, to communicate with the IVR systems.

Audio messages from the IVR systems provide callers with information and further prompt the callers to enter data or to make selections from a variety of choices. One example of such an audio message is: "for choice A, press one; for choice B, press two; for choice C, press three . . .". If the number of choices is large, it may be necessary to present the choices in more than one menu. In that case, the final part of the message prompts the caller to provide a particular input in order to receive an additional message that lists other choices (e.g. "Press nine to hear more options"). Callers navigate through IVR systems by providing appropriate input in response to each message in order to get to the next desired message or to select a desired choice.

A disadvantage of IVR systems to date is that, as the functionality (i.e. number of choices) of the system increases, the number and complexity of the prompt messages increases. In some instances, it may become very difficult for a caller to navigate through an IVR system to a desired choice. IVR systems to date do not adequately address the problem of increasing system functionality without appreciably increasing the difficulty of use. In particular, it may be very difficult to navigate through a Web page converted to an audio format using above IVR systems where the menus are effectively limited to ten choices per menu.

A further disadvantage of IVR systems to date is that a caller must look at the telephone keypad, hunt for the right key, and then press it in order to select a menu item. For a caller who is using a wireless telephone, this involves removing the handset from his/her ear and then looking at the keypad and pressing the correct key. This can be cumbersome, especially if the caller is driving at the same time. Furthermore,

immediately after pressing a key selection, further instructions may be issued by an IVR system, which may be missed by a caller as he/she may be putting their handset back to his/her ear.

5 **Summary of the Invention**

The disadvantages of conventional menu presentation in an IVR system can be reduced by inserting an audio space between the presentation of each of the items and, at any time during the presentation of an item and the audio space thereafter, receiving any key press from an input device of a caller to indicate the selection of the item just  
10 presented. The IVR system presents the next item on the menu after each audio space following the previous, unselected, item. The menu items of a list are repeated if no item is selected after a presentation. If there has not been a selection after a number of repetitions, the IVR system may present an option to exit the system or to transfer to a live operator.

15 It is a further aspect of the present invention to assign a skip key in the IVR system, which when pressed by a user, indicates skipping to the next item on the list thus shortening the time required to present the list of items.

It is a further aspect of the present invention to provide a menu presentation of an IVR system using voice recognition to detect "YES" and "NO" to indicate a selection and  
20 a skipping respectively.

It is a further aspect of the present invention to facilitate conversion of Web pages into an audio menu by playing text associated with each selection and inserting an audio space after the text of each selection for selection by a user or for skipping to the next selection.

25 According to an aspect of the invention, there is provided a method of presenting an item from a menu of an IVR system for selection, comprising: presenting the item to a caller; presenting an audio space to the caller; and detecting any of a number of inputs from an input device during the presentation of the item and the audio space to indicate the selection of the item by the caller.

30 According to a further aspect of the invention, there is provided a method of presenting a Web page in an audio format to a user, comprising: converting selectable items in the Web page into the audio format; inserting an audio space after each of the items; presenting the items and associated audio spaces to the caller; and detecting any of

a number of inputs from an input device during the presentation of an item and associated audio space to indicate the selection of the item by the caller.

### Brief Introduction to the Drawings

5 In the accompanying drawings:

Figure 1 is a block diagram of a conventional menu presentation in an IVR system;

Figure 2 is a block diagram of a menu presentation in an IVR system in accordance with a preferred embodiment of the present invention;

Figure 3 is a conversion diagram of HTML hyperlinks converted to IVR menu items; and

10 Figure 4 is a block diagram of a menu presentation in an IVR system in accordance with a further embodiment using voice recognition.

### Detailed Description of the Preferred Embodiments

Referring to Figure 1, a block diagram of a conventional menu presentation in an  
 15 IVR system is shown. In the conventional menu presentation, the IVR system comprises a greeting 100, presenting a menu 110, and presenting requested item 120 where the presenting the menu 110 is repeated once the requested information 120 has been presented. The menu 110 comprises a play message 104 of "Press <key> for <name of item>", which is repeated for each item until a key press of a key number for the desired  
 20 item is detected 116, there upon a user is sent to next task 118. The next task may be a new list of items for play message 104 to play, but in due course, the requested item 120 is presented.

Referring to Figure 2, a block diagram of a menu presentation in an IVR system in accordance with a preferred embodiment of the present invention is shown. The menu  
 25 presentation of the IVR system comprises a greeting 200, presenting a menu 210, and presenting requested item 250 where presenting the menu 210 is repeated once the requested information 250 has been presented. The menu 210 comprises a play message 220 "Please press any upon hearing the item you desire", a play message 225 for a <name of item> is presented, and wait x seconds (audio space) 230 for any key press. After  
 30 waiting x seconds (audio space) 230, the play message 225 for the next item is presented. When a key press is detected 235 during the play message 225 and the associated audio space 230, the item just played or being played by the play message 225 system is selected and the system goes to next task 240. The next task 240 may be a new list of items for the play message 225, but in due course, the requested information 250 is presented.

An example menu presentation of Figure 2 is described, solely for purposes of illustration and is not intended to limit the scope of the invention, as follows:

<Default Greeting>

"Please press a key when you hear the service that you desire"

5 <Item 1> audio space

<Item 2> audio space

<Item 3> audio space

<Item 4> audio space

10 <Repeat from Item 1> and present an option to exit the system or to transfer to a live operator after a set number of repetitions

<Requested Item>.

The audio space may be one second in length or other suitable time period. Any key press during "<Item #> audio space" indicates selection of the "Item #". Thus, a user does not have to look at a keypad to press the right key, as there is no right key or wrong key; every  
15 key is a right key. The keypad of a handset thus behaves as a computer mouse controller and selecting is accomplished by clicking.

It is preferable that presentation of a menu be optimized to present more popular items first. An optimization algorithm may further use any identifying information of the caller, such as that from Caller ID or CLID service, to present the items first which are  
20 mostly likely to be selected by the particular caller. The algorithm may be generated by collecting data on user selections and then statistically analyzing the collected data.

Further optimization for menu presentation include setting time to wait periods for audio spaces. The time to wait depends largely on expected user recognition of menus presented. This variable is tuned to meet the following criteria: giving users enough time  
25 to recognize and make a decision on a menu item just presented, and reducing the time it takes to present the menu so as to cover all items as quickly as possible. The goal is not to force the users to wait a long time before hearing the service he/she desires.

The two criteria are somewhat diametrically opposed, the variable time to wait, X, may be tuned empirically. One possible way of tuning X is to deploy the service with a  
30 default value for X. Then, each time a menu item is selected, the time it takes for the user to make his/her decision is collected. After many such samples as desired are collected, then the optimal value for X is statistically calculated for each menu item on the menu. Thus, there may be a number of time to wait, X, settings for the menu items.

In a further embodiment of the present invention, Internet Web pages are converted into audio format to facilitate access by devices without any display means. The links and hyperlinks are items in a Web page to be presented with an audio space after each item. The links and hyperlinks are selected during their presentation and the audio space  
5 thereafter by any key press on the input device of the caller.

An example of Internet Web page conversion is described and shown in Figure 3 solely for purposes of illustration and is not intended to limit the scope of the invention. As shown in Figure 3, HTML hyperlinks are converted to IVR menu items programmatically with a conversion program where the program looks for HTML key words such as  
10 <TITLE> or <A HREF...> and converts them to equivalent IVR function calls. As most HTML key words are followed by the text or label of that key word, which text is displayed on the web page for such things as the title of the page or the wording of a hyperlink, these texts are then translated into IVR phrases or messages.

Referring to Figure 4, there is shown a block diagram of a menu presentation in an  
15 IVR system in accordance with a further embodiment using voice recognition. The menu presentation of the IVR system comprises a greeting 400, presenting a menu 410, and presenting requested item 450 where presenting the menu 410 is repeated once the requested information 450 has been presented. The menu 410 comprises a play message  
20 420 "Please press any key or say YES upon hearing the item you desire. Please say NO to skip service", a play message 425 for a <name of item> is presented, and wait x seconds (audio space) 430 for any key press or voice detection of YES or NO. After waiting x seconds (audio space) 430 or upon voice detection of a NO, the play message 425 for the next item is presented. When a key press or a YES voice detection is detected 435 during  
25 the play message 425 or the associated audio space 430, the item just played by the play message 425 system is selected and the system goes to next task 440. The next task 440 may be a new list of items for the play message 425, but in due course, the requested information 450 is presented. Thus, by using a NO to skip items, the speed of menu presentation can also be increased by users.

Alternately, selection of an item can on detection by a speech recognition device  
30 on recognition of a "YES" only or of any sound from a caller, which indicates a selection.

Alternately, an IVR system according to the present invention may also provide for pressing of a certain key to skip a play message and its audio space to the next play message.

Alternately, an IVR system or Web page may also include a command to play back the last item. Such a selection may be made by a caller pressing the \* or # key of a touch-tone telephone and, in an embodiment with a speech recognition device, on recognition of the word "back" or similar command.

5           Although preferred embodiments of the invention have been described herein, it will be understood by those skilled in the art that variations may be made thereto without departing from the spirit of the invention or the scope of the appended claims.



What is claimed is:

1. A method of presenting an item from a menu of an IVR system for selection, comprising:
  - presenting the item to a caller;
  - presenting an audio space to the caller; and
  - detecting any of a number of inputs from an input device during the presentation of the item and the audio space to indicate the selection of the item by the caller.
2. The method of claim 1, further comprising listening for an input from the caller during the presentation of the item and the audio space which indicates a command to represent the item.
3. The method of claim 1, further comprising listening for an input from the caller during the presentation of the item and the audio space, which indicates a command to skip further presentation of the item and the audio space.
4. The method of claim 1, wherein further presentation of the item and the audio space is skipped after detecting selection of the item.
5. The method of any of claims 1 to 4, wherein the callers issue voice commands as input and where voice recognition is used to recognize the input.
6. The method of any of claims 1 to 5, further comprising organizing the presentation of the items in order of likely selection with the most likely selection being first.
7. The method of any of claims 1 to 2, wherein the pressing of any key of the input device, during the presentation of the item and the audio space, to indicate the selection of the item.
8. A method of presenting a Web page in an audio format to a user, comprising:

converting selectable items in the Web page into the audio format;

inserting an audio space after each of the items;

5

presenting the items and associated audio spaces to the caller; and

detecting any of a number of inputs from an input device during the presentation of  
an item and associated audio space to indicate the selection of the item by the caller.

10

9. The method of claim 8, further comprising listening for an input from the caller  
during the presentation of the item and the audio space which indicates a command to re-  
present the item.

15

10. The method of claim 8, further comprising listening for an input from the caller  
during the presentation of the item and the audio space, which indicates a command to  
skip further presentation of the item and the audio space.

20

11. The method of claim 8, wherein further presentation of the item and the audio  
space is skipped after detecting selection of the item.

12. The method of any of claims 8 to 11, wherein the callers issues voice commands as  
input and where voice recognition is used to recognize the input.

25

13. The method of any of claims 8 to 12, further comprising organizing the  
presentation of the items in order of likely selection with the most likely selection being  
first.

30

14. The method of any of claims 8 to 13, wherein the pressing of any key of the input  
device, during the presentation of the item and the audio space, to indicate the selection of  
the item.

Figure 1  
(Prior Art)

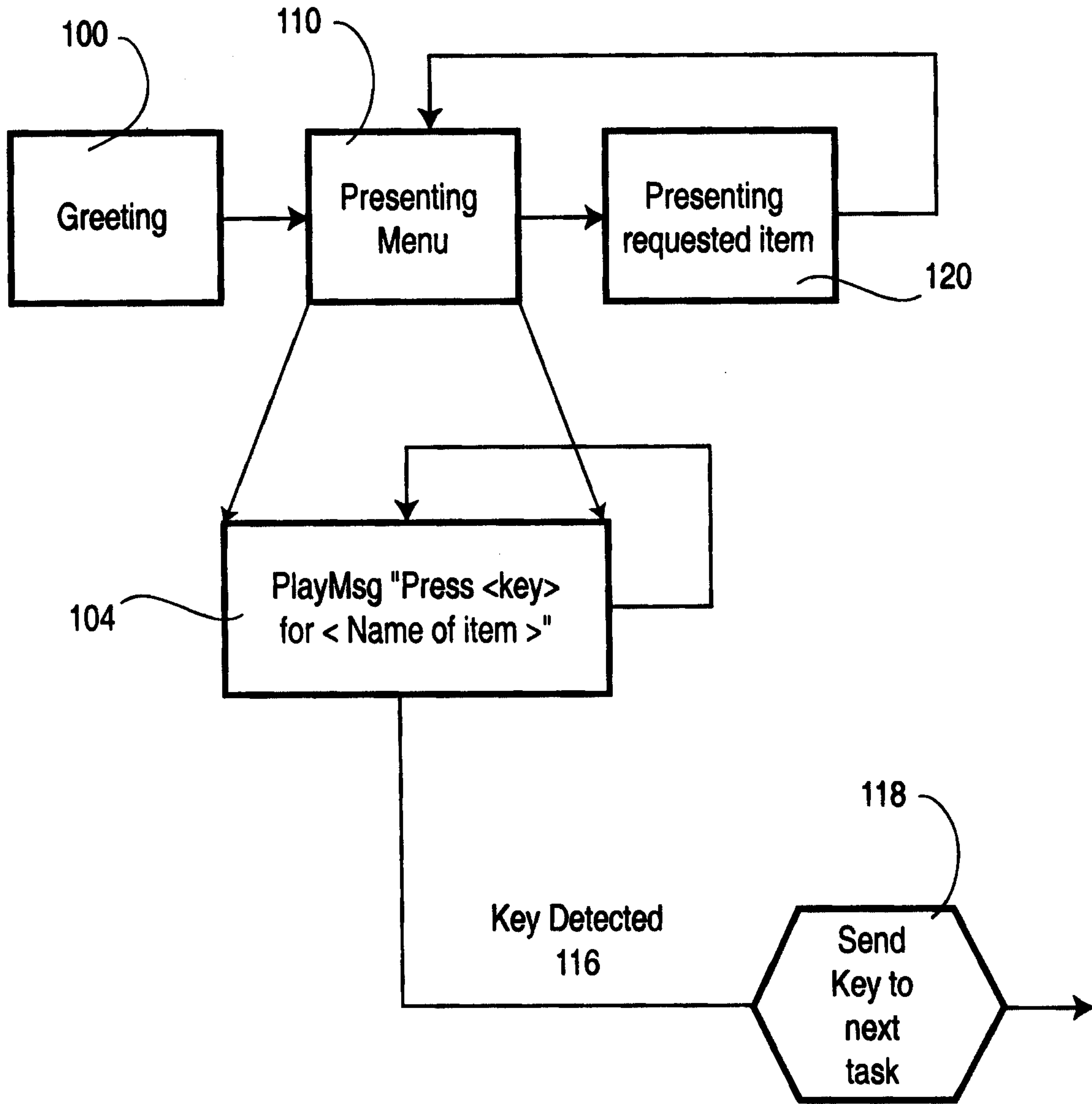


Figure 2

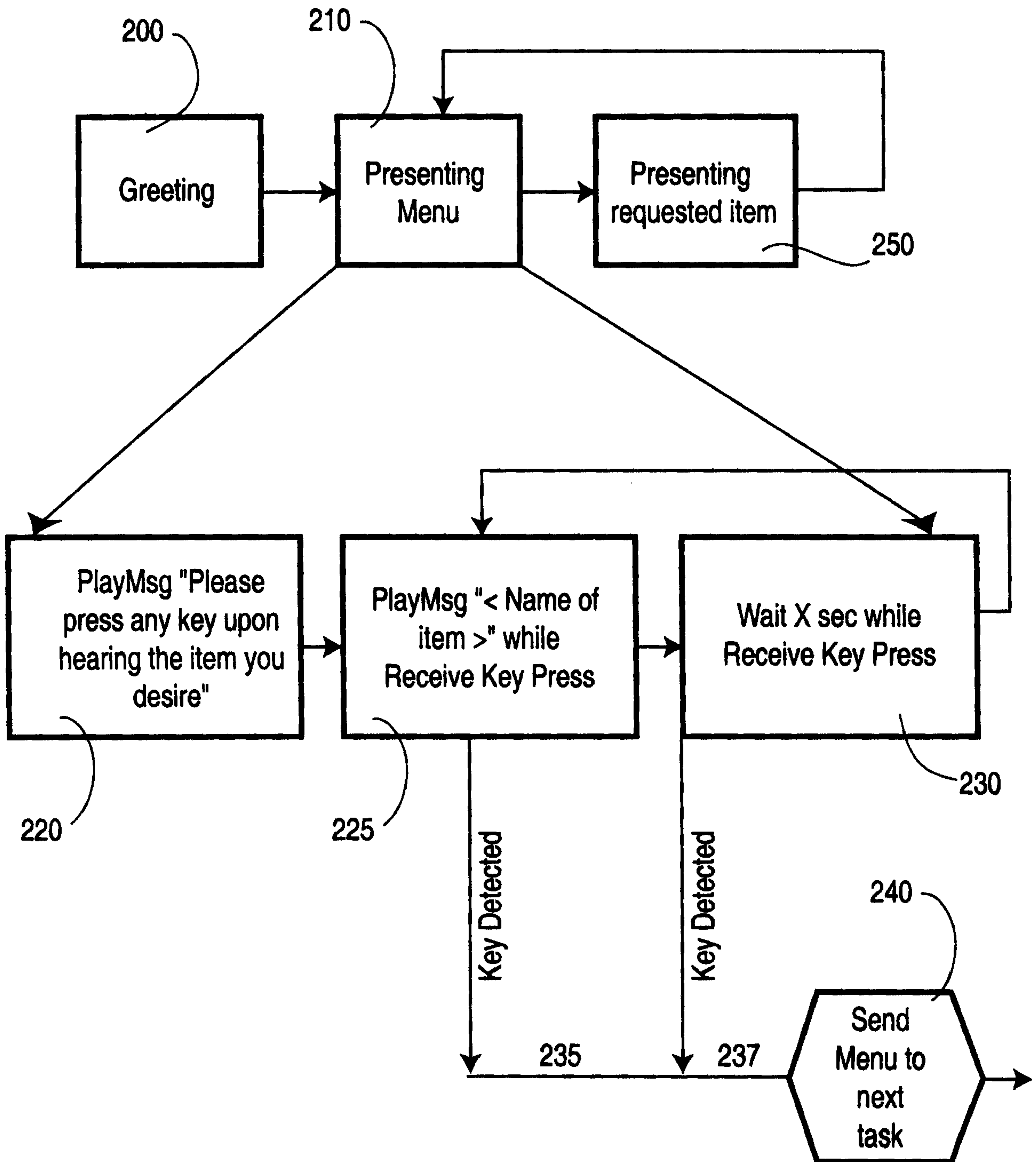
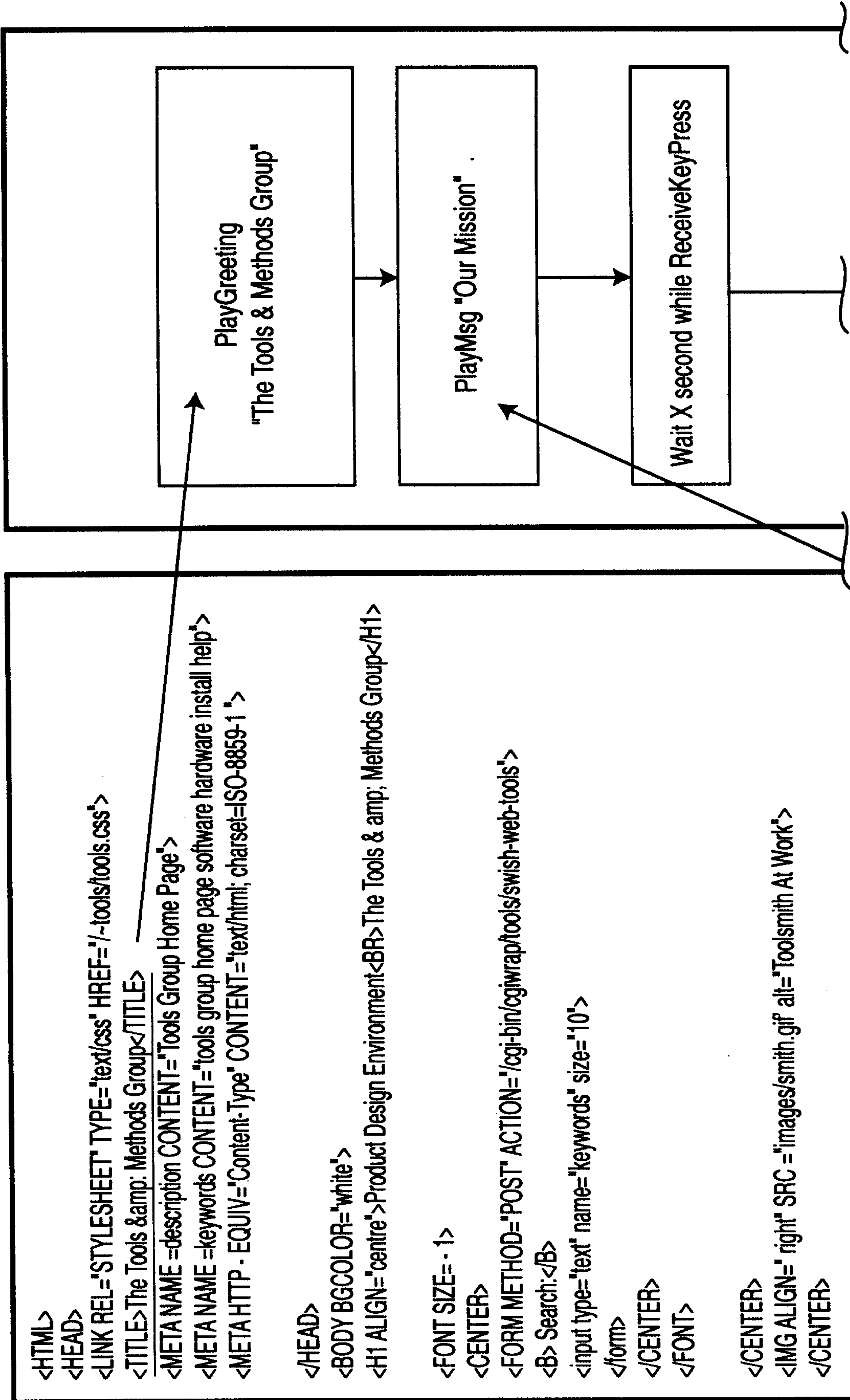


Figure 3A



<HTML>  
<HEAD>

<LINK REL="stylesheet" TYPE="text/css" HREF="/~tools/tools.css">

<TITLE>The Tools & Methods Group</TITLE>

<META NAME =description CONTENT="Tools Group Home Page">

<META NAME =keywords CONTENT="tools group home page software hardware install help">

<META HTTP - EQUIV="Content-Type" CONTENT="text/html; charset=ISO-8859-1 ">

</HEAD>

<BODY BGCOLOR="white">

<H1 ALIGN="centre">Product Design Environment<BR>The Tools & Methods Group</H1>

<FONT SIZE=- 1 >

<CENTER>

<FORM METHOD="POST" ACTION="/cgi-bin/cgiwrap/tools/swish-web-tools">

<B> Search:</B>

<input type="text" name="keywords" size="10">

</form>

<CENTER>

</FONT>

<CENTER>

<IMG ALIGN=" right" SRC = "images/smith.gif" alt="Toolsmith At Work">

</CENTER>

PlayGreeting  
"The Tools & Methods Group"

PlayMsg "Our Mission"

Wait X second while ReceiveKeyPress

<B>If you want to order hardware or software, <A HREF="/helpdesk">use these forms</A>. If you can't find what you looking for, try the <A HREF="/search">search</A> engine. Detailed information about the tools we support can be found in the <A HREF="/tools\_db/">tools database</A>. A list of people to call for tools support can be found <A HREF="/contacts.html">here</A>. <B>

```

<P>
<TABLE CLOS="4">
<TR>
<TH ALIGN="left" WIDTH="20%">
General Information
</TH>
<TH ALIGN="left" WIDTH="20%">
 
</TH>
<TH ALIGN="left" WIDTH="20%">
 
</TH>
<TH ALIGN="left" WIDTH="20%">
 
</TH>
<TD VALIGN="top" ALIGN="left">
<UL TYPE="disc">
<LI> <A HREF="/mission.html"> Our Mission </A>
    
```

Figure 3B

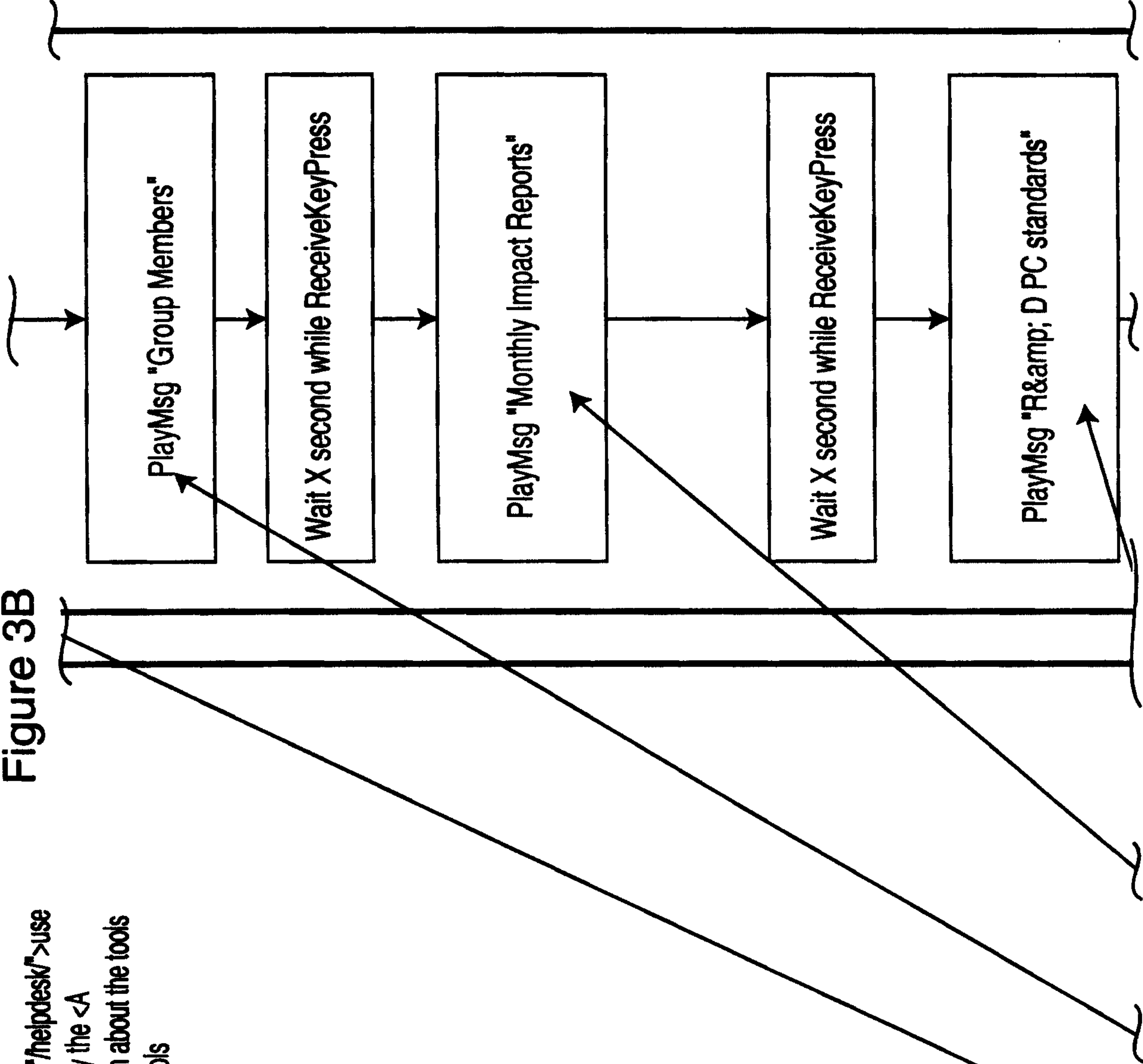


Figure 3C

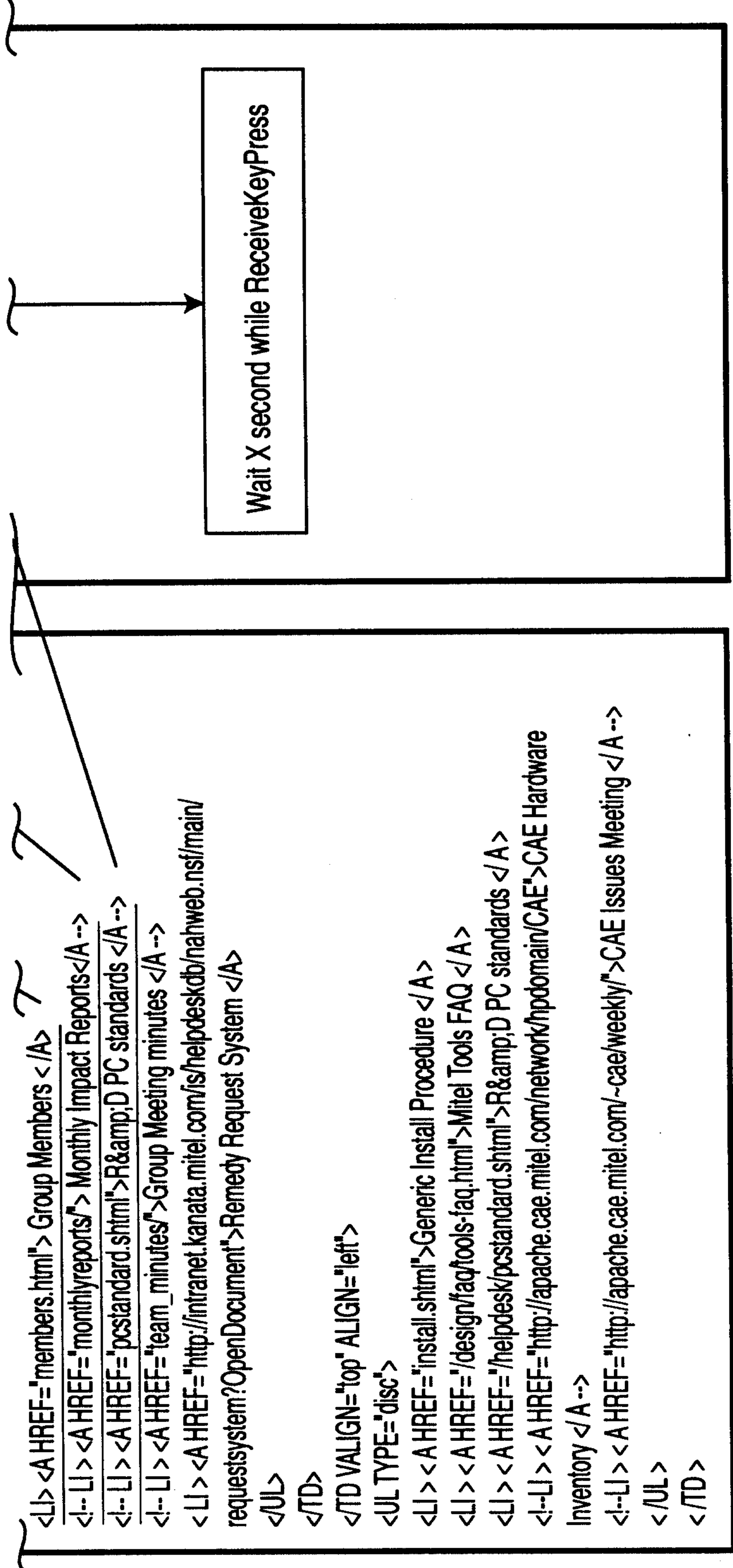


Figure 4

