

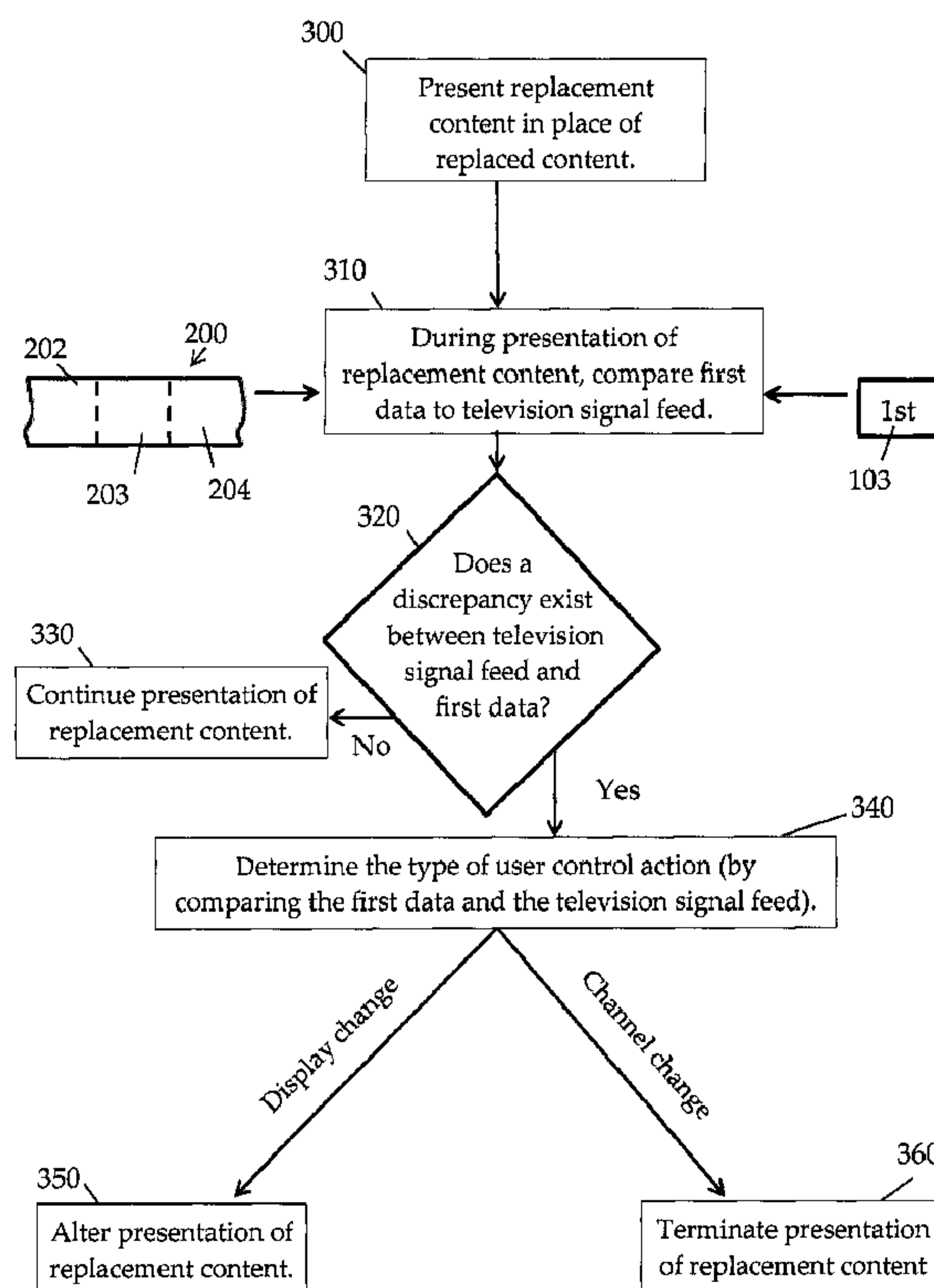


(86) **Date de dépôt PCT/PCT Filing Date:** 2014/01/30
 (87) **Date publication PCT/PCT Publication Date:** 2014/08/07
 (45) **Date de délivrance/Issue Date:** 2016/12/20
 (85) **Entrée phase nationale/National Entry:** 2015/07/22
 (86) **N° demande PCT/PCT Application No.:** US 2014/013924
 (87) **N° publication PCT/PCT Publication No.:** 2014/120965
 (30) **Priorité/Priority:** 2013/01/30 (US13/754,639)

(51) **Cl.Int./Int.Cl. H04N 21/43** (2011.01),
H04N 21/25 (2011.01)
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(54) **Titre : COMMANDE UTILISATEUR POUR LE REMPLACEMENT DE PUBLICITES TV INSEREES PAR UNE TELEVISION INTELLIGENTE**

(54) **Title: USER CONTROL OF REPLACEMENT TELEVISION ADVERTISEMENTS INSERTED BY A SMART TELEVISION**



(57) **Abrégé/Abstract:**

A method is performed using a smart TV, which receives from a television signal source device a television signal feed encoding primary television content and then presents that content. The smart TV receives data via the computer network, including first data

(57) Abrégé(suite)/Abstract(continued):

representing a to-be-replaced portion of the primary television content and second data representing secondary television content. Using the second data, the smart TV automatically presents the secondary television content in place of the to-be-replaced television content. The method includes the smart TV: (a) automatically monitoring, during presentation of the secondary television content, the television signal feed and comparing it with the first data; and (b) automatically altering presentation of the secondary television content in accordance with a user-control action with respect to the television signal source device, in response to detecting any difference between the television signal feed and the first data indicative of that user-control action.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
7 August 2014 (07.08.2014)

(10) International Publication Number
WO 2014/120965 A1

- (51) **International Patent Classification:**
H04N 21/43 (2011.01) *H04N 21/25* (2011.01)
- (21) **International Application Number:**
PCT/US2014/013924
- (22) **International Filing Date:**
30 January 2014 (30.01.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
13/754,639 30 January 2013 (30.01.2013) US
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- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,

DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

- *with international search report (Art. 21(3))*

(54) **Title:** USER CONTROL OF REPLACEMENT TELEVISION ADVERTISEMENTS INSERTED BY A SMART TELEVISION

(57) **Abstract:** A method is performed using a smart TV, which receives from a television signal source device a television signal feed encoding primary television content and then presents that content. The smart TV receives data via the computer network, including first data representing a to-be-replaced portion of the primary television content and second data representing secondary television content. Using the second data, the smart TV automatically presents the secondary television content in place of the to-be-replaced television content. The method includes the smart TV: (a) automatically monitoring, during presentation of the secondary television content, the television signal feed and comparing it with the first data; and (b) automatically altering presentation of the secondary television content in accordance with a user-control action with respect to the television signal source device, in response to detecting any difference between the television signal feed and the first data indicative of that user-control action.



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**USER CONTROL OF REPLACEMENT TELEVISION ADVERTISEMENTS
INSERTED BY A SMART TELEVISION**

BACKGROUND

[0001] The field of the present invention relates to targeted television ad
5 replacement using a so-called "smart TV." In particular, systems and methods are
disclosed herein for terminating or altering targeted television ad replacement in
response to a user-control action.

[0002] A goal of modern television advertising is targeted selection of
advertisements for individual households or even for specific viewers in those
10 households. Numerous techniques and methodologies are available for (i) collecting
user profile information from one or more sources (online or offline), (ii) using that
profile information to select one or more targeted advertisements, (iii) using the profile
information to select one or more programs or channels for presenting the targeted
advertisements, and (iv) correlating subsequent viewer actions after presenting the
15 targeted advertisements. Some of these techniques and methodologies are
described in:

- U.S. Pat. No. 7,861,260 entitled "Targeted television advertisements based
on online behavior" issued 12/28/2010 to Shkedi;

- U.S. Pat. No. 8,566,164 entitled "Targeted online advertisements based on
20 viewing or interacting with television advertisements" issued 10/22/2013 in the names
of Shkedi et al;

- U.S. Pat. No. 9,083,853 entitled "Targeted television advertisements
associated with online users' preferred television programs or channels" issued
07/14/2015 in the name of Shkedi;

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- U.S. Pat. No. 8,051,444 entitled "Targeted television advertisements selected on the basis of an online user profile and presented with television programs or channels related to that profile" issued 11/01/2011 to Shkedi; and

5 - U.S. Pat. No. 7,890,609 entitled "Requesting offline profile data for online use in a privacy-sensitive manner" issued 02/15/2011 to Shkedi.

[0003] Typically a targeted television advertisement is inserted into the stream of presented television content in place of a non-targeted advertisement. A "targeted advertisement" refers to an advertisement shown to users based on taking into account user-specific profile information. A "non-targeted advertisement" refers to an
10 advertisement shown to a large group of users without use of user-specific profile information; it may be "targeted" in a different sense, such as selected based on broad demographic characteristics, such as the demographic characteristics of users who watch a particular television program. A variety of technological approaches are employed to achieve proper insertion of targeted television advertisements into the
15 stream of presented television content.

SUMMARY

[0004] According to an aspect of the present invention, there is provided a method performed using a computer associated with a television display and connected to a computer network and to a television signal source device, wherein: a television
20 signal feed having encoded thereon primary television content is received from the television signal source device and the primary television content is presented via the television display; the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising
25 electronic indicia of secondary television content; the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and the method comprises: (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal

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feed and comparing it with the first data; and (b) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the presentation of the secondary television content in accordance with the user-control action.

[0005] According to another aspect of the present invention, there is provided a smart TV comprising: a computer; a connection to a television signal source device arranged so as to receive from the television signal source device a television signal feed having encoded thereon primary television content; a television display structured and connected to present the primary television content; and a connection to a computer network, wherein: the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content; the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and the computer is programmed to perform a method comprising: (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and (b) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the smart TV, automatically altering, with the computer, the presentation of the secondary television content in accordance with the user-control action.

[0006] According to another aspect of the present invention, there is provided an article comprising a non-transitory computer-readable storage medium, in a smart TV or in a storage device controlled by a server connected to a computer network, which medium encodes computer-readable instructions that, when applied to a computer in a smart TV, instruct the computer to perform a method wherein: a television signal

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feed having encoded thereon primary television content is received from the television signal source device and the primary television content is presented via the television display; the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a
5 to-be-replaced portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content; the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and the method comprises: (a) during presentation
10 of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and (b) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer of the smart TV,
15 automatically altering, with the computer, the presentation of the secondary television content in accordance with the user-control action.

[0007] According to another aspect of the present invention, there is provided a method performed using a computer associated with a television display and connected to a computer network and to a television signal source device, wherein: a
20 television signal feed having encoded thereon primary television content is received from the television signal source device and the primary television content is presented via the television display; the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data
25 comprising electronic indicia of secondary television content; the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and the method comprises: (a) during presentation of the secondary television content, automatically monitoring, with the computer, the
30 television signal feed and comparing it with the first data to detect a viewing speed difference therebetween; and (b) in response to detecting the viewing speed

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difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the speed of presentation of the
5 secondary television content in accordance with the user-control action.

[0008] According to another aspect of the present invention, there is provided a smart TV comprising: a computer; a connection to a television signal source device arranged so as to receive from the television signal source device a television signal feed having encoded thereon primary television content; a television display
10 structured and connected to present the primary television content; and a connection to a computer network, wherein: the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content; the computer is programmed to
15 present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and the computer is programmed to perform a method comprising: (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data to detect a
20 viewing speed difference therebetween; and (b) in response to detecting the viewing speed difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the speed of presentation of the
25 secondary television content in accordance with the user-control action.

[0009] According to another aspect of the present invention, there is provided an article comprising a tangible computer-readable medium that is not a transitory propagating signal, in a smart TV or in a storage device controlled by a server connected to a computer network, which medium encodes computer-readable
30 instructions that, when applied to a computer in a smart TV, instruct the computer to

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perform a method wherein: the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content; the computer is programmed to
5 present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and the computer is programmed to perform a method comprising: (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data to detect a
10 viewing speed difference therebetween; and (b) in response to detecting the viewing speed difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the speed of presentation of the
15 secondary television content in accordance with the user-control action.

[0010] In some embodiments, a method is performed using a computer associated with a television display and connected to a computer network and to a television signal source device (collectively, a so-called smart TV). The smart TV receives from the television signal source device a television signal feed having encoded thereon
20 primary television content, and presents the primary television content via the television display. The computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content. The computer is programmed to
25 present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content.

[0011] The method comprises: (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and
30 comparing it with the first data; and (b) in response to detecting any difference,

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between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, automatically altering, with the computer, the presentation of the secondary television content in accordance with the user-control action.

- 5 **[0012]** Advantages pertaining to presenting replacement television content using a smart TV according to some embodiments, may become apparent upon referring to the embodiments disclosed in the following written description.

[0013] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is
 10 not intended to identify key features or essential features of the subject matter, nor is it intended to be used as an aid in determining the scope of the subject matter.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a block diagram of an embodiment of the smart TV showing its connection to an exemplary television signal source device and computer network.

- 15 Fig. 2 is a schematic diagram illustrating content replacement in an exemplary television signal feed.

Fig. 3 is a flow chart illustrating an exemplary method.

DETAILED DESCRIPTION OF EMBODIMENTS

[0014] In some cases, capabilities of a so-called “smart television” (*i.e.*, smart TV
 20 100 shown in Fig. 1) are utilized to achieve insertion of the targeted, replacement television advertisement in place of a non-targeted television advertisement. A smart television, like any other television, has a connection to one or more television signal source devices. Examples of television signal source devices 130 can include, but are not limited to: a digital antenna; a set-top box (STB) for cable, satellite, or Internet
 25 Protocol Television (IPTV); a digital video recorder (DVR); a so-called entertainment-oriented device (EOD) such as a game console or a so-called “Over The Top” device (OTT; examples include Apple TV® or Roku®). Smart TV 100 receives from

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television signal source device 130 a television signal feed 200 that has encoded thereon television content and presents via television display 101 the encoded television content. Television content, as used herein in any context, may comprise audio or video or both. Television content encoded in television signal feed 200 shall
5 be referred to herein as the primary television content. The television content can be encoded into television signal feed 200 by television signal source device 130, or it can merely pass through that device already encoded. The primary television content can include programming of any sort (*e.g.*, live, recorded, on-demand, broadcast, multicast, unicast, and so on). The primary television content often includes one or
10 more non-targeted or targeted television advertisements (broadcast, multicast, or unicast), which can be inserted by television signal source device 130 or are already present in the primary television content by the time the television signal feed reaches that device. An example can include a STB uncompressing a broadcasted MPEG2 compressed 720p television program into a 720p uncompressed format,
15 which is delivered from STB 130 to smart TV 100 via HDMI interface 135. The television program can include advertisements broadcasted as part of the program or advertisements inserted into the program by STB 130 (instead of or in addition to the broadcasted ads).

[0015] As also seen in Fig. 1, smart TV 100 also has its own connection 145 to
20 computer network 140 through which smart TV 100 can be provided with online access, *e.g.*, access to the Internet. Smart TV 100 can receive television content through computer network connection 145. Smart TV 100 also includes one or more computer processors or processor cores 110 and one or more computer memories 120 (collectively referred to hereinafter as the “smart TV computer” or simply
25 “computer” 160) that enable it to receive, store, or process data or programming instructions. Such data and programming can be employed, *e.g.*, to enable smart TV 100 to receive targeted television advertisements and to present them in place of non-targeted television advertisements that are part of the primary television content.

[0016] An example of a conventional method for inserting a targeted television
30 advertisement into stream 200, shown in Fig. 2, of primary television content can be

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performed as follows using computer network connection 145 and smart TV computer 160. Smart TV 100 receives via computer network 140 electronic indicia of data representative of portions of the primary television content. First data 103 represents the portion of the primary television content intended to be replaced (e.g., typically a non-targeted advertisement; referred to as the “to-be-replaced content” or simply “replaced content” 203); other data 102 represents a portion of the primary television content that immediately precedes replaced content 203 (referred to as the “preceding content” 202; e.g., another advertisement or a portion of programming content). Smart TV 100 receives via computer network 140 electronic indicia of second data 105 representative of secondary television content (e.g., typically a targeted advertisement; referred to as “replacement content” 205). Using computer 160, smart TV 100 automatically (i) monitors the television signal feed 200 it receives from television signal source 130 to detect or otherwise determine the end of preceding content 202 and (ii) presents after preceding content 202, using second data 105, replacement content 205 instead of replaced content 203. Once replacement content 205 is presented, smart TV 100 can revert to presentation of the primary television content. In another example, smart TV 100 determines the end of preceding content 202 by identifying a signal or cue sent as part of feed 200. The signal or cue could be embedded in preceding content 202 (such as in the last frame of preceding content 202 for example) or in the gap between preceding content 202 and replaced content 203 or in the beginning of replaced content 203.

[0017] In all cases discussed herein, data streams like first data 103 can comprise a so-called “fingerprint” of one or more portions of the primary television content (e.g., a digital video fingerprint generated in any suitable way), a compressed digital encoding of one or more portions of the primary television content, a raw, uncompressed encoding of one or more portions of the primary television content, or other suitable representative data that enables smart TV 100 to identify the corresponding television content in television signal feed 200 (i.e., replaced 203 or preceding 202 content). If a fingerprint of the primary television content is employed, it can be generated according to any one of several known techniques or protocols. One example of a fingerprint of a segment of television content can rely on sampling

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within every video frame of that segment of the television content. Smart TV 100, or a central server in possession of the segment samples, can compare the samples of the segment with a sample taken by smart TV 100 from television signal feed 200. Based on that comparison, smart TV 100 or the central server can recognize a

5 specific frame within the segment. Likewise, the second data can comprise any suitable compressed or uncompressed encoding of the secondary television content (*i.e.*, replacement content 205). Different or parallel compression protocols can be used for first 103 and second 105 data. If a fingerprint of the primary television

10 content is employed for first data 103, it can be generated according to any one of several known techniques or protocols (one example can include taking a sample of audio, video, or both from TV feed 200 and comparing it with an equivalent sample of known content). A given fingerprint of television content can be generated based on both video and audio portions of that content, on the video portion only, or on the audio portion only.

15 **[0017a]** In some other examples (in which fingerprints are not employed or employed partially), smart TV 100 receives via Internet 140 first 103 or second 105 data in, *e.g.*, MPEG4 or other compressed format. The compressed format saves bandwidth so as to enable the parallel transmission of a multitude of different targeted ads to a multitude of corresponding households watching television

20 simultaneously. In one example, entire advertisements (not just portions; the preceding, replaced, and targeted advertisements) are sent to smart TV 100, which then uncompresses the three advertisements. The uncompressed preceding ad 202 is compared with uncompressed television signal feed 200 transmitted from STB 130, *e.g.*, via HDMI. At the end of preceding ad 202, uncompressed, targeted,

25 replacement advertisement 205 is inserted by smart TV 100 in place of replaced advertisement 203. While presenting targeted, replacement advertisement 205, smart TV 100 monitors television signal feed 200 for changes in replaced advertisement 203 by comparing feed 200 with replaced advertisement 203 received over the Internet 140. Alternatively, instead of comparing uncompressed television signal feed

30 200 and received advertisements, smart TV 100 instead can compress television

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signal feed 200 and do the comparisons described above using compressed television signal feed 200 and received advertisements.

[0017b] The example methods and systems described above create a technical problem relating to viewer control. Typically, television signal source device 130
5 mediates viewer control of the presentation of the primary television content. Various user-control actions can be executed through television signal source device 130, whether by direct manipulation (e.g., pushing buttons on a STB), or by use of a remote control or auxiliary device 150 (e.g., a tablet or smartphone software application controlling the STB). Examples of user-control actions executed through
10 television signal source device 130 can include a channel change or a display change.

[0017c] A channel change denotes switching among multiple different streams of distinct broadcast, multicast, unicast, or locally stored television content that can be live, prerecorded, time-shifted, or on-demand. A display change can include: (i) a so-
15 called “trick mode” (e.g.: fast forward at various speeds such as 4X, 8X, 32X, or other; rewind or fast reverse at various speeds such as 4X, 8X, 32X, or other; pause or resume; or skipping forward or backward by various specified time intervals, numbers of frames, or scenes); (ii) loop, repeat, or replay; (iii) slow motion or stop action; (iv) changing the zoom, stretch, or aspect ratio; (v) changing viewing angle or
20 other 3D viewing parameter(s); (vi) changing between, e.g., “standard,” “movie,” “sports,” “game,” or other display presets; or (vii) changing backlight, contrast, brightness, color, tint sharpness, color temperature, or other picture quality parameters.

[0017d] Such user-control actions, when executed through television signal source
25 device 130, affect television signal feed 200, which in turn affects the presentation by smart TV 100 of the primary television content. In that capacity, smart TV 100 acts as a passive presentation device, becoming “active” (i.e., directly affecting the presentation of television content) only when it presents a replacement advertisement or other replacement television content 205. Note that some display changes can
30 also be executed using smart TV 100 (e.g., items (iv) – (vii) listed above, or even

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items (i) – (iii) if smart TV 100 has sufficient memory 120 or buffering capabilities), even when presenting television content provided by television signal source device 130 via television signal feed 200. However, only those display changes executed through television signal source device 130 are considered for purposes of the present disclosure.

[0017e] Because user-control actions, when executed through television signal source device 130, affect only television signal feed 200 from television signal source device 130, such user-control actions ordinarily would have no discernible effect on any replacement television content 205 being presented on smart TV display 101. In other words, in conventional techniques, if a viewer attempts to execute a control action during presentation of replacement content 205, the control action would appear disabled. The control action indeed would affect television signal feed 200 (fast forward, pause, etc.), but display 101 would continue to show replacement content 205, undisturbed by the control action. This state of affairs (*i.e.*, seemingly ineffectual user-control actions) would persist until replacement content 205 finished showing, at which time presentation would revert to the primary television content (presumably modified, unbeknownst to the user, in compliance with the intervening user-control actions, or perhaps just the last user-control action).

[0017f] It would be desirable to provide systems and methods that mitigate the problem described above.

[0018] In one or more of the illustrative embodiments disclosed herein, various examples of methods for inserting a targeted television advertisement into a stream

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of primary television content can be performed as follows using various examples of systems that include computer network connection 145 and computer 160 of smart TV 100. Parts of those methods proceed substantially as described above.

[0019] In a first group of one or more embodiments, using computer 160 and first data 103, smart TV 100 automatically compares, as in 310 of Fig. 3, during presentation of replacement content 205 via smart TV 100, television signal feed 200 with first data 103 (representative of replaced content 203). Any detected discrepancy between television signal feed 200 and first data 103 indicates that a user has performed a user-control action with respect to television signal source device 130. For example, if the user attempts a display change (e.g., a trick mode) or a channel change, first data 103 (indicative of replaced content 203 at regular viewing speed), would no longer correspond to television signal feed 200, because the user-control action would alter the signal feed. If no such discrepancy is detected (indicating no user-control action was attempted) and presentation of replacement content 205 finishes without any user-control action being taken, as in 330 of Fig. 3, then in some embodiments, presentation of television content via smart TV 100 can, as in the conventional examples, simply revert to presentation of the primary television content. Depending on whether replaced content 203 is finished when replacement content 205 finishes, presentation may revert to an end portion of replaced content 203 or to a portion of the primary content immediately after replaced content 203 (referred to as "succeeding content" 204).

[0020] If replacement television content 205 ends before replaced television content 203, an end portion of replaced television content 203 might be presented after completion of replacement content 205. That may result in a television presentation that may be jarring, confusing, or annoying to viewers due to the abrupt and seemingly mysterious appearance of a fragment of replaced content 203. In a second group of one or more embodiments, if replacement content 205 reaches its end before the end of replaced content 203, smart TV 100 can present a black screen (or a blank screen of a different color, a user-selected color controlled by a user setting in the smart TV, or any other suitable filler material) to fill the gap between the end of

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replacement content 205 and the end of replaced content 203. A black screen can be used in countries where a black screen identifies the end of one segment of television content and the beginning of a succeeding segment of unrelated television content (e.g., a transition from a television program to a television advertisement, from one television advertisement to another, or from a television advertisement to a television program). In countries where a different type of screen is used to identify the end of one segment of content and the beginning of the next, that corresponding kind of screen will be inserted as filler content by smart TV 100 to fill the gap from the end of replacement content 205 to the end of replaced content 203. In one example implementation of a black screen, smart TV 100 inserts the black frames. When smart TV 100, using computer 160 and first data 103, detects the end of replaced content 203 in television signal feed 200 while presenting such filler content, it can then revert presentation to the primary television content encoded in television signal feed 200, providing the viewer with a smooth transition from replacement content 205 to succeeding content 204.

[0021] If, on the other hand, smart TV 100 does detect a discrepancy, in 320 of Fig. 3, between first data 103 (indicative of replaced content 203) and television signal feed 200, that indicates that a user-control action was attempted. In a third group of one or more embodiments, in response to detecting such a discrepancy, smart TV 100 automatically terminates presentation of replacement content 205 and reverts to presentation of replaced content 203. That shift eliminates the misleading appearance that the user-control action did not work, because smart TV 100 discontinues presentation of replacement content 205, and the viewer can see the effects of his or her control action on the resumed presentation of replaced content 203.

[0022] However, as with the case where replacement content 205 ends before replaced content 203 ends, this situation also results in presentation of television content that may appear jarring, confusing, or annoying to viewers due to the sudden switch, upon attempting to execute a user-control action, between different television advertisements. An exception is the case wherein the user-control action is a channel

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change; in that instance the abrupt appearance of different television content would be expected.

[0023] A fourth group of one or more embodiments help eliminate the presentation problems described in the previous paragraphs. In response to detecting, at 320 of Fig. 3, a discrepancy between first data 103 (representative of replaced content 203) and television signal feed 200, smart TV 100 can automatically, using computer 160 and first data 103, determine, as shown at 340 of Fig. 3, what type of user-control action has been executed, e.g., fast forward, fast reverse, pause, or channel change. Because the user-control action is done with respect to television signal source device 130, and not smart TV 100, determination of the type of user-control action cannot typically be done directly. Instead, in 340 of Fig. 3, smart TV 100 determines the user-control action by comparing first data 103 and television signal feed 200. For example, if first data 103 includes the video portion of replaced content 203, then smart TV 100 can compare the first data video with the video portion of television signal feed 200. A pause action on signal source device 130 results in the freezing of the video on one particular frame. Smart TV 100 can identify the frozen frame by comparing the first data video frames with the signal feed frozen frame. The comparison can be made between entire frames or between only sample sets of pixels of each frame. A fast forward action on signal source device 130 results in only selected frames being sent in television signal feed 200 to smart TV 100 (the higher the fast forward rate, the fewer and further between are the selected frames sent to the smart TV). Smart TV 100 can compare whole frames or sample pixels in the received signal feed frames with whole frames or sample pixels in the first data to recognize the selected fast-forward rate (e.g., 4X, 8X, or 32X regular viewing speed). A fast reverse action on the signal source device can be identified in a similar way. A channel change can be identified when smart TV 100 cannot find a match between a frame of the video in television signal feed 200 and a frame of the video in first data 103. The comparison of television signal feed 200 and first data 103 typically is based on video for recognizing a display change, including trick mode functionality such as pause, resume, fast forward, rewind, fast reverse, or skip. For recognizing a channel

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switch or the end of a replaced advertisement, audio or video or both can be used as a basis for comparison. Alternatively, smart TV 100 can determine the type of user-control action in those cases wherein television signal source device 130 reports the type of user-control action to smart TV 100, for example via a CEC (Consumer
5 Electronics Control) connection over HDMI.

[0024] If the user-control action is a channel change, then smart TV 100 can simply terminate presentation of replacement television content 205, see 360 of Fig. 3, and revert to presentation of replaced television content 203 encoded on television signal feed 200 (now altered due to the channel change). As noted above, the abrupt
10 appearance of different presented television content would be expected in that instance.

[0025] If smart TV 100 determines that the user-control action is a display change such as a trick mode, then, using computer 160 and second data 105, smart TV 100 can alter presentation of replacement content 205, see 350 of Fig. 3, to substantially
15 match the altered television signal feed. For example, if a fast forward of replaced content 203 is detected, then smart TV 100 can adjust presentation of replacement content 205 by fast-forwarding it in parallel (e.g., by skipping frames). Smart TV 100 can be programmed to mimic in its presentation of replacement content 205 the effect of various user-control display change actions on replaced content 203. The
20 substitution of replacement content 205 for replaced content 203 therefore becomes “transparent” to the viewer, who can no longer necessarily discern whether he or she is seeing the original television content (e.g., a non-targeted television advertisement) versus replacement television content (e.g., a targeted television advertisement). User-control actions (channel change or display change) appear to function normally
25 even if replacement content 205 is being presented.

[0026] In a fifth group of one or more embodiments, after replacement content 205 has been presented and its display completed, smart TV 100 can again insert replacement content 205 if, for example, a rewind or fast reverse user-control action is executed beginning from a time after the conclusion of replacement content 205.

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To accomplish this, the sequence of steps described above can be executed again, with smart TV 100 detecting succeeding content 204, presenting replacement content 205 (possibly altered depending on user-control actions), monitoring television signal feed 200 during a second presentation of replacement content 205, and terminating or altering the repeated presentation of replacement content 205 in response to a user-control action. A purpose of this technique is to allow the user to review replacement content 205 after the succeeding television show (for example) resumes. Without this technique, if the user rewinds from a point after replacement content 205 has been completed, the user would see replaced content 203 instead of replacement content 205, and the user would not be able to find replacement content 205. To enable such "rewinding" of replacement content 205, smart TV 100 receives electronic indicia of additional data 104 that represents a portion of the primary television content that immediately follows replaced content 203 (*i.e.*, succeeding content 204) or creates such additional data by itself, for example by fingerprinting succeeding content 204 or simply recording it. Smart TV 100 automatically monitors the rewound television signal feed 200 it receives from television signal source 130 and compares it with additional data 104 to detect or otherwise determine the beginning of succeeding content 204.

[0027] In some instances, the same replacement content 205 can be inserted each time replaced content 203 (or preceding content 202 or succeeding content 204) is detected by smart TV 100. In other instances, different replacement content can be inserted in place of replaced content 203; the choice of replacement content is part of the targeting process when the replacement content is a targeted advertisement. Any suitable sequence of replacement content can be employed for insertion in place of a given portion of replaced content 203 upon repeated encounters with that given portion. In one example, the same advertisement can be presented each time the given portion of replaced content 203 is encountered (forward or backward). In another example, one advertisement can be presented a number of times, followed by another advertisement presented a number of times, and so on. In a third example, number of different advertisements can be rotated through one at a time at

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each encounter with the replaced content. In a fourth example, each replacement advertisement is presented during only one encounter with the given replacement content; at each subsequent encounter a new advertisement is presented that has not been presented before.

5 **[0028]** In a sixth group of one or more embodiments, if the television content that includes the preceding and succeeding content 202, 204 is replayed at a later time (e.g., stored on a DVR or retrieved from an “on-demand” system), the same replacement content 205 can be presented each time the primary content is replayed, or different replacement content can be selected than would be selected for the initial
10 or earlier presentations of the content. Subsequent replays can include still other replacement content. Any suitable variation, selection, or rotation of replacement content, including those described in the preceding paragraph, can be employed.

[0029] The systems and methods disclosed herein can be implemented as general or special purpose computers or servers or other programmable hardware devices
15 programmed through software, or as hardware or equipment “programmed” through hard wiring, or a combination of the two. A “computer” (e.g., as in a “smart TV”) can comprise a single processor, processor core, or machine or can comprise multiple interacting processors, processor cores, or machines (located at a single location or at multiple locations remote from one another). A computer memory or computer-
20 readable medium can be encoded with a computer program, so that execution of that program by one or more computers causes the one or more computers to perform one or more of the methods disclosed herein. Suitable media can include temporary or permanent storage or replaceable media, such as network-based or Internet-based or otherwise distributed storage of software modules that operate together,
25 RAM, ROM, CD ROM, CD-R, CD-RW, DVD ROM, DVD±R, DVD±RW, hard drives, thumb drives, flash memory, optical media, magnetic media, semiconductor media, or any future storage alternatives. Such encoded media can be preinstalled already encoded in a smart TV during its manufacture, can be encoded after installation into a smart TV during its manufacture, or can be encoded with “client” or “application”
30 software copied or downloaded into the smart TV after its manufacture. For example,

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client software can be downloaded to the smart TV as part of occasional or periodic software updates received by the smart TV, typically via its network connection.

[0030] In addition to the preceding, the following examples fall within the scope of the present disclosure:

5 **[0031]** Example 1. A method performed using a computer associated with a television display and connected to a computer network and to a television signal source device, wherein: a television signal feed having encoded thereon primary television content is received from the television signal source device and the primary television content is presented via the television display; the computer is programmed
10 to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content; the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-
15 be-replaced television content; and the method comprises: (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and (b) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device,
20 automatically altering, with the computer, the presentation of the secondary television content in accordance with the user-control action.

[0032] Example 2. The method of Example 1 further comprising reverting to presentation of the primary television content after presenting the secondary television content.

25 **[0033]** Example 3. The method of any preceding Example wherein (i) the user-control action indicated by the detected difference between the television signal feed and the first data is a channel change, and (ii) altering the presentation of the

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secondary television content comprises terminating presentation of the secondary television content and resuming presentation of the primary television content.

[0034] Example 4. The method of any preceding Example wherein (i) the user-control action indicated by the detected difference between the television signal feed and the first data is a display change, and (ii) altering the presentation of the secondary television content comprises altering presentation of the secondary television content in a manner analogous to the user-control action indicated by the detected difference between the television signal feed and the first data.

[0035] Example 5. The method of any preceding Example wherein (i) the primary television content comprises one or more television programs and one or more associated television advertisements, and (ii) the secondary television content comprises one or more replacement television advertisements.

[0036] Example 6. The method of any preceding Example further comprising, after presenting the secondary television content, automatically presenting filler television content via the television display in place of an end portion of the to-be-replaced television content.

[0037] Example 7. The method of an preceding Example further comprising, after presenting the secondary television content and after a user-control action of rewinding or fast-reversing the primary television content to a point within or before the to-be-replaced television content, again automatically presenting at least a portion of the secondary television content in place of the to-be-replaced television content.

[0038] Example 8. The method of any preceding Example further comprising: (c) after presenting the secondary television content and during later time-shifted or on-demand presentation of the primary television content via the television display, automatically presenting different secondary television content in place of the to-be-replaced television content; (d) during presentation of the different secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and (e) in response to detecting any

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difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, automatically altering, with the computer, the presentation of the different secondary television content in accordance with the user-control action.

5 **[0039]** Example 9. A smart TV comprising: a connection to a television signal source device arranged so as to receive from the television signal source a television signal feed having encoded thereon primary television content; a television display structured and connected to present the primary television content; a computer; and a connection to a computer network, wherein the computer is programmed to perform
10 the method of any preceding Example.

[0040] Example 10. An article comprising a computer-readable medium in a smart TV or in a storage device controlled by a server connected to a computer network, which medium encodes computer-readable instructions that, when applied to a computer in a smart TV, instruct the computer to perform the method of any
15 preceding Example.

[0041] It is intended that equivalents of the disclosed illustrative embodiments and methods shall fall within the scope of the present disclosure. It is intended that the disclosed illustrative embodiments and methods, and equivalents thereof, may be modified while remaining within the scope of the present disclosure.

20 **[0042]** In the foregoing Detailed Description, various features may be grouped together in several illustrative embodiments for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that any embodiment requires more features than are expressly recited. Rather, inventive subject matter may lie in less than all features of a single disclosed
25 embodiment. The present disclosure shall also be construed as implicitly disclosing any embodiment having any suitable set of one or more disclosed features (*i.e.*, sets of features that are not incompatible or mutually exclusive) that appear in the present disclosure, including those sets that may not be explicitly disclosed herein. In

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particular, any embodiment that falls within any one of the six groups of embodiments disclosed above, and any embodiment that falls within any combination of two or more of those six groups of embodiments, shall be regarded as falling within the scope of the present disclosure. Further, any embodiment explicitly or implicitly disclosed herein can be implemented using any suitable set of one or more known or future developed features, including but not limited to those disclosed in the Background.

[0043] For purposes of the present disclosure, the conjunction “or” is to be construed inclusively (*e.g.*, “a dog or a cat” would be interpreted as “a dog, or a cat, or both”; *e.g.*, “a dog, a cat, or a mouse” would be interpreted as “a dog, or a cat, or a mouse, or any two, or all three”), unless: (i) it is explicitly stated otherwise, *e.g.*, by use of “either...or,” “only one of,” or similar language; or (ii) two or more of the listed alternatives are mutually exclusive within the particular context, in which case “or” would encompass only those combinations involving non-mutually-exclusive alternatives. For purposes of the present disclosure, the words “comprising,” “including,” “having,” and variants thereof, wherever they appear, shall be construed as open ended terminology, with the same meaning as if the phrase “at least” were appended after each instance thereof.

[0044] If any one or more disclosures are incorporated herein by reference and such incorporated disclosures conflict in part or whole with, or differ in scope from, the present disclosure, then to the extent of conflict, broader disclosure, or broader definition of terms, the present disclosure controls. If such incorporated disclosures conflict in part or whole with one another, then to the extent of conflict, the later-dated disclosure controls.

[0045] The Abstract is provided as required as an aid to those searching for specific subject matter within the patent literature. However, the Abstract is not intended to imply that any elements, features, or limitations recited therein are necessarily limiting of the scope of the invention.

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CLAIMS:

1. A method performed using a computer associated with a television display and connected to a computer network and to a television signal source device, wherein:
- 5 a television signal feed having encoded thereon primary television content is received from the television signal source device and the primary television content is presented via the television display;
- the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced
- 10 portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content;
- the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and
- 15 the method comprises:
- (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and
- (b) in response to detecting any difference, between the television
- 20 signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the presentation of the secondary television content in accordance with the user-control action.
- 25 2. The method of claim 1 further comprising reverting to presentation of the primary television content after presenting the secondary television content.

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3. The method of claim 1 or 2 wherein (i) the user-control action indicated by the detected difference between the television signal feed and the first data is a channel change, and (ii) altering the presentation of the secondary television content comprises terminating presentation of the secondary television content and resuming
5 presentation of the primary television content.
4. The method of claim 1 or 2 wherein (i) the user-control action indicated by the detected difference between the television signal feed and the first data is a display change, and (ii) altering the presentation of the secondary television content
10 comprises altering presentation of the secondary television content in a manner analogous to the user-control action indicated by the detected difference between the television signal feed and the first data.
5. The method of any one of claims 1 to 4 wherein (i) the primary television content comprises one or more television programs and one or more associated television advertisements, and (ii) the secondary television content
15 comprises one or more replacement television advertisements.
6. The method of any one of claims 1 to 5 further comprising, after presenting the secondary television content, automatically presenting filler television content via the television display in place of an end portion of the to-be-replaced television content.
- 20 7. The method of any one of claims 1 to 6 further comprising, after presenting the secondary television content and after a user-control action of rewinding or fast-reversing the primary television content to a point within or before the to-be-replaced television content, again automatically presenting at least a portion of the secondary television content in place of the to-be-replaced television content.
- 25 8. The method of any one of claims 1 to 7 further comprising:

(c) after presenting the secondary television content and during later time-shifted or on-demand presentation of the primary television content via the

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television display, automatically presenting different secondary television content in place of the to-be-replaced television content;

(d) during presentation of the different secondary television content, automatically monitoring, with the computer, the television signal feed and comparing
5 it with the first data; and

(e) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, automatically altering, with the computer, the presentation of the different secondary television content in accordance with the user-
10 control action.

9. The method of any one of claims 1 to 8 wherein (i) the computer and the television display comprise a smart television and (ii) the television signal source device comprises a cable or satellite set-top box.

10. A smart TV comprising:

15 a computer;

a connection to a television signal source device arranged so as to receive from the television signal source device a television signal feed having encoded thereon primary television content;

20 a television display structured and connected to present the primary television content; and

a connection to a computer network,

wherein:

the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced

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portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content;

the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content
5 in place of the to-be-replaced television content; and

the computer is programmed to perform a method comprising:

(a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and

10 (b) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the smart TV, automatically altering, with the computer, the presentation of the secondary television content in accordance with the user-control action.

15 11. The smart TV of claim 10 wherein the method further comprises reverting to presentation of the primary television content after presenting the secondary television content.

12. The smart TV of claim 10 or 11 wherein (i) the user-control action indicated by the detected difference between the television signal feed and the first
20 data is a channel change, and (ii) altering the presentation of the secondary television content comprises terminating presentation of the secondary television content and resuming presentation of the primary television content.

13. The smart TV of claim 10 or 11 wherein (i) the user-control action indicated by the detected difference between the television signal feed and the first
25 data is a display change, and (ii) altering the presentation of the secondary television content comprises altering presentation of the secondary television content in a

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manner analogous to the user-control action indicated by the detected difference between the television signal feed and the first data.

14. The smart TV of any one of claims 10 to 13 wherein (i) the primary television content comprises one or more television programs and one or more associated television advertisements, and (ii) the secondary television content comprises one or more replacement television advertisements.

15. The smart TV of any one of claims 10 to 14 wherein the method further comprises, after presenting the secondary television content, automatically presenting filler television content via the television display in place of an end portion of the to-be-replaced television content.

16. The smart TV of any one of claims 10 to 15 wherein the method further comprises, after presenting the secondary television content and after a user-control action of rewinding or fast-reversing the primary television content to a point within or before the to-be-replaced television content, again automatically presenting at least a portion of the secondary television content in place of the to-be-replaced television content.

17. The smart TV of any one of claims 10 to 16 wherein the method further comprises:

(c) after presenting the secondary television content and during later time-shifted or on-demand presentation of the primary television content via the television display, automatically presenting different secondary television content in place of the to-be-replaced television content;

(d) during presentation of the different secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and

(e) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the

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television signal source device, automatically altering, with the computer, the presentation of the different secondary television content in accordance with the user-control action.

18. The smart TV of any one of claims 10 to 17 wherein (i) the computer
5 and the television display comprise a smart television and (ii) the television signal source device comprises a cable or satellite set-top box.

19. An article comprising a non-transitory computer-readable storage
medium, in a smart TV or in a storage device controlled by a server connected to a
computer network, which medium encodes computer-readable instructions that, when
10 applied to a computer in a smart TV, instruct the computer to perform a method
wherein:

a television signal feed having encoded thereon primary television
content is received from the television signal source device and the primary television
content is presented via the television display;

15 the computer is programmed to utilize data received via the computer
network, including (i) first data comprising electronic indicia of a to-be-replaced
portion of the primary television content and (ii) second data comprising electronic
indicia of secondary television content;

20 the computer is programmed to present automatically via the television
display, using the second data, at least a portion of the secondary television content
in place of the to-be-replaced television content; and

the method comprises:

(a) during presentation of the secondary television content,
automatically monitoring, with the computer, the television signal feed and comparing
25 it with the first data; and

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(b) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer of the smart TV, automatically altering, with the computer, the presentation
5 of the secondary television content in accordance with the user-control action.

20. The article of claim 19 wherein the method further comprises reverting to presentation of the primary television content after presenting the secondary television content.

21. The article of claim 19 or 20 wherein (i) the user-control action indicated
10 by the detected difference between the television signal feed and the first data is a channel change, and (ii) altering the presentation of the secondary television content comprises terminating presentation of the secondary television content and resuming presentation of the primary television content.

22. The article of claim 19 or 20 wherein (i) the user-control action indicated
15 by the detected difference between the television signal feed and the first data is a display change, and (ii) altering the presentation of the secondary television content comprises altering presentation of the secondary television content in a manner analogous to the user-control action indicated by the detected difference between the television signal feed and the first data.

20 23. The article of any one of claims 19 to 22 wherein (i) the primary television content comprises one or more television programs and one or more associated television advertisements, and (ii) the secondary television content comprises one or more replacement television advertisements.

24. The article of any one of claims 19 to 23 wherein the method further
25 comprises, after presenting the secondary television content, automatically presenting filler television content via the television display in place of an end portion of the to-be-replaced television content.

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25. The article of any one of claims 19 to 24 wherein the method further comprises, after presenting the secondary television content and after a user-control action of rewinding or fast-reversing the primary television content to a point within or before the to-be-replaced television content, again automatically presenting at least a
5 portion of the secondary television content in place of the to-be-replaced television content.

26. The article of any one of claims 19 to 25 wherein the method further comprises:

(c) after presenting the secondary television content and during later
10 time-shifted or on-demand presentation of the primary television content via the television display, automatically presenting different secondary television content in place of the to-be-replaced television content;

(d) during presentation of the different secondary television content, automatically monitoring, with the computer, the television signal feed and comparing
15 it with the first data; and

(e) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, automatically altering, with the computer, the presentation of the different secondary television content in accordance with the user-
20 control action.

27. The article of any one of claims 19 to 26 wherein (i) the computer and the television display comprise a smart television and (ii) the television signal source device comprises a cable or satellite set-top box.

28. A method performed using a computer associated with a television
25 display and connected to a computer network and to a television signal source device, wherein:

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a television signal feed having encoded thereon primary television content is received from the television signal source device and the primary television content is presented via the television display;

the computer is programmed to utilize data received via the computer
5 network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content;

the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content
10 in place of the to-be-replaced television content; and

the method comprises:

(a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data to detect a viewing speed difference therebetween; and

15 (b) in response to detecting the viewing speed difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the speed of presentation of the secondary television content in
20 accordance with the user-control action.

29. The method of claim 28 further comprising reverting to presentation of the primary television content after presenting the secondary television content.

30. The method of claim 28 wherein (i) the user-control action indicated by the detected viewing speed difference between the television signal feed and the first
25 data is a fast-forward command, and (ii) altering the presentation of the secondary television content comprises presentation of the secondary television content at a faster speed.

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31. The method of claim 28 wherein (i) the user-control action indicated by the detected viewing speed difference between the television signal feed and the first data is a fast-forward command, and further comprising detecting the fast-forward rate, and (ii) altering the presentation of the secondary television content comprises
5 altering presentation of the secondary television content at the detected fast-forward rate.

32. The method of claim 28 wherein (i) the primary television content comprises one or more television programs and one or more associated television advertisements, and (ii) the secondary television content comprises one or more
10 replacement television advertisements.

33. The method of claim 28 further comprising, after presenting the secondary television content, automatically presenting filler television content via the television display in place of an end portion of the to-be-replaced television content.

34. The method of claim 28 wherein (i) the user-control action indicated by
15 the detected viewing speed difference between the television signal feed and the first data is a rewind or fast-reverse command, (ii) altering the presentation of the secondary television content comprises presentation of the secondary television content in a reverse direction.

35. The method of claim 28 further comprising:

20 (c) after presenting the secondary television content and during later time-shifted or on-demand presentation of the primary television content via the television display, automatically presenting different secondary television content in place of the to-be-replaced television content;

(d) during presentation of the different secondary television content,
25 automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and

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(e) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, automatically altering, with the computer, the presentation of the different secondary television content in accordance with the user-
5 control action.

36. The method of Claim 28 wherein (i) the computer and the television display comprise a smart television and (ii) the television signal source device comprises a cable or satellite set-top box.

37. The method of Claim 28 wherein the comparing of the television signal
10 feed and the first data is based on whole frames.

38. The method of Claim 28 wherein the comparing of the television signal feed and the first data is based on sample pixels.

39. A smart TV comprising:

a computer;

15 a connection to a television signal source device arranged so as to receive from the television signal source device a television signal feed having encoded thereon primary television content;

a television display structured and connected to present the primary television content; and

20 a connection to a computer network,

wherein:

the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced portion of the primary television content and (ii) second data comprising electronic
25 indicia of secondary television content;

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the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content in place of the to-be-replaced television content; and

the computer is programmed to perform a method comprising:

5 (a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data to detect a viewing speed difference therebetween; and

(b) in response to detecting the viewing speed difference, between the television signal feed and the first data, indicative of a user-control action with respect
10 to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the speed of presentation of the secondary television content in accordance with the user-control action.

40. The smart TV of Claim 39 wherein (i) the user-control action indicated
15 by the detected viewing speed difference between the television signal feed and the first data is a fast-forward command, and (ii) altering the presentation of the secondary television content comprises presentation of the secondary television content at a faster speed.

41. The smart TV of Claim 39 wherein (i) the user-control action indicated
20 by the detected viewing speed difference between the television signal feed and the first data is a fast-forward command, and further comprising detecting the fast-forward rate, and (ii) altering the presentation of the secondary television content comprises altering presentation of the secondary television content at the detected fast-forward rate.

25 42. The smart TV of Claim 39 wherein (i) the user-control action indicated by the detected viewing speed difference between the television signal feed and the first data is a rewind or fast-reverse command, (ii) altering the presentation of the

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secondary television content comprises presentation of the secondary television content in a reverse direction.

43. The smart TV of Claim 39 wherein the method further comprises:

5 (c) after presenting the secondary television content and during later time-shifted or on-demand presentation of the primary television content via the television display, automatically presenting different secondary television content in place of the to-be-replaced television content;

10 (d) during presentation of the different secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data; and

15 (e) in response to detecting any difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, automatically altering, with the computer, the presentation of the different secondary television content in accordance with the user-control action.

44. The smart TV of Claim 39 wherein the comparing of the television signal feed and the first data is based on whole frames.

45. The smart TV of Claim 39 wherein the comparing of the television signal feed and the first data is based on sample pixels.

20 46. An article comprising a tangible computer-readable medium that is not a transitory propagating signal, in a smart TV or in a storage device controlled by a server connected to a computer network, which medium encodes computer-readable instructions that, when applied to a computer in a smart TV, instruct the computer to perform a method wherein:

25 the computer is programmed to utilize data received via the computer network, including (i) first data comprising electronic indicia of a to-be-replaced

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portion of the primary television content and (ii) second data comprising electronic indicia of secondary television content;

the computer is programmed to present automatically via the television display, using the second data, at least a portion of the secondary television content
5 in place of the to-be-replaced television content; and

the computer is programmed to perform a method comprising:

(a) during presentation of the secondary television content, automatically monitoring, with the computer, the television signal feed and comparing it with the first data to detect a viewing speed difference therebetween; and

10 (b) in response to detecting the viewing speed difference, between the television signal feed and the first data, indicative of a user-control action with respect to the television signal source device, and without receiving the user-control action at the computer associated with the television display, automatically altering, with the computer, the speed of presentation of the secondary television content in
15 accordance with the user-control action.

47. The article of Claim 46 wherein (i) the user-control action indicated by the detected viewing speed difference between the television signal feed and the first data is a fast-forward command, and further comprising detecting the fast-forward rate, and (ii) altering the presentation of the secondary television content comprises
20 altering presentation of the secondary television content at the detected fast-forward rate.

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FIG. 1

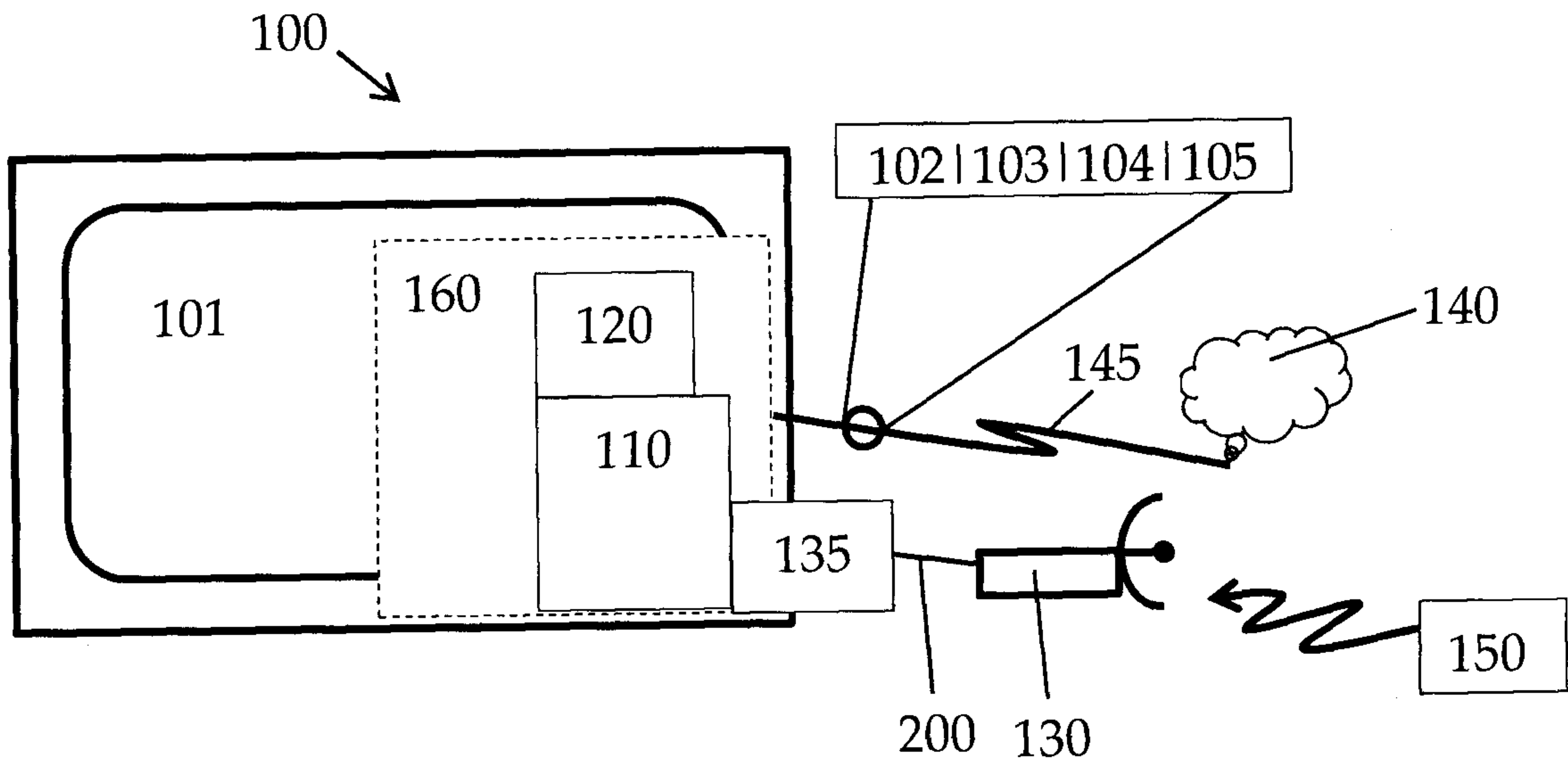
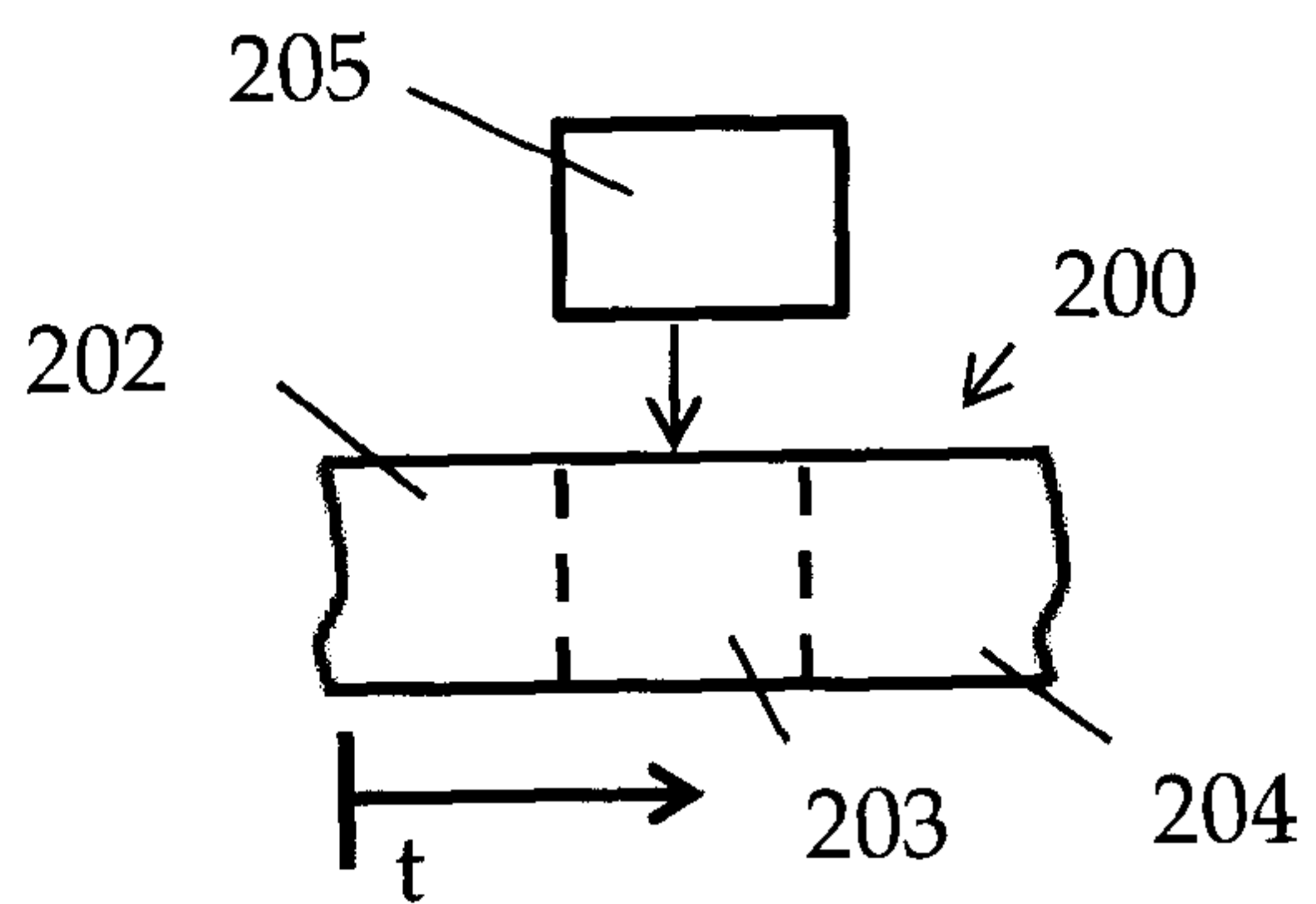


FIG. 2



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FIG. 3

