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(54) Title: SYSTEM AND METHOD FOR CONNECTING A PRESENTATION DEVICE TO A WIRELESS PRESENTATION SYSTEM UNIT

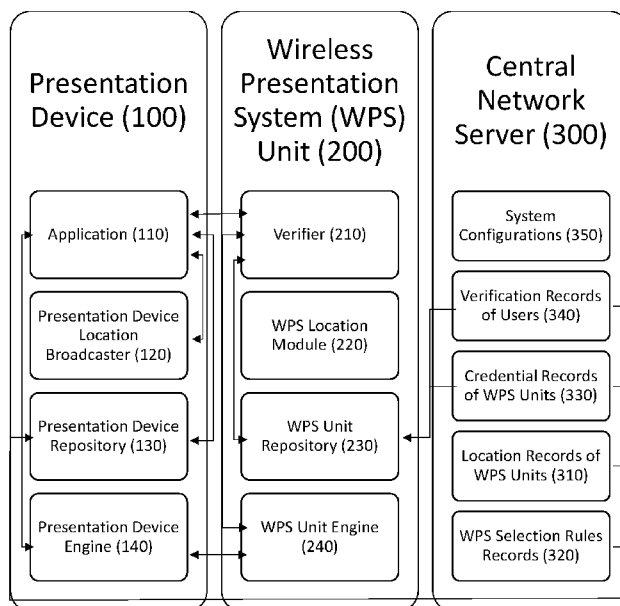


FIGURE 1

(57) Abstract: The present invention teaches a system that allows at least one presentation device (100) to correctly select a wireless presentation system (WPS) unit (200) from an environment comprising a plurality of WPS units (200) based on the proximity level of each WPS unit (200), and subsequently to wirelessly connect to the selected WPS unit (200) with a user centric focused verification. A method for achieving the above teaching is also discussed herein.

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SYSTEM AND METHOD FOR CONNECTING A PRESENTATION DEVICE TO A WIRELESS PRESENTATION SYSTEM UNIT

5 FIELD OF THE INVENTION

This invention relates to a wireless presentation system, and more particularly to a system and a method for connecting a presentation device to the wireless presentation system.

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BACKGROUND OF THE INVENTION

A wireless presentation system (WPS) unit is an advancement of technology that can improve the productivities mainly in collaborative environments such as conference rooms, auditoriums, meeting rooms, classrooms, lecture halls, general
15 workplaces, and university campuses. It is a great presentation delivery tool that enables multiple users with different presentation devices such as laptops, mobile phones, tablets, and the likes to connect to and share contents on a particular audio visual (AV) device such as projectors, televisions, speakers, and the likes, without the need to physically connect to either the WPS unit nor the AV device.

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Typically, in a relatively huge environment such as a university campus, many WPS units are employed. In such case, the WiFi network list for this type of environment can be and usually are very extensive, and may contain many WiFi SSID including those for the WPS units. More often than not, the naming of these
25 WiFi SSID is very similar, leading to confusion among users. They will face issues on identifying the correct WPS unit to connect to, and may even cause them to unintentionally connect to another WPS unit that is not in close proximity.

Further, the current WPS unit is lacking a simpler means to establish a connection
30 with the presentation device of the user. Even if the user manages to correctly select the desired WPS unit, he or she is required to be aware of that particular WPS unit's network details and sign-in credentials.

US patent no. 9,854,411 B2 discloses systems, method, and modes for sharing presentation content displayed on a meeting room during a meeting. US patent publication no. 2014/0361954 A1 discloses a system and apparatus for use with a presentation system. However, both teachings do not focus on WPS unit
5 selection based on locations, and user centric verification for the purpose of establishing a connection.

Therefore, there is a great need of providing a system and method for a presentation device to correctly select a particular WPS unit to connect to, based
10 on locations, and also for verifying the identity of the presentation device with a user-centric verification approach.

SUMMARY OF INVENTION

15 It is an objective of the present invention to provide a system that allows at least one presentation device to correctly select and subsequently to connect to at least one wireless presentation system (WPS) unit from an environment comprising a plurality of WPS units, with the purpose to stream contents of the presentation device, via the selected WPS unit, to at least one audio visual (AV) device that is
20 connected to the selected WPS unit.

In one embodiment of the present invention, the selection is made based on a proximity level of each WPS unit. The proximity level is defined by the distance between the location of the presentation device and the location of each WPS unit
25 in the environment.

In another embodiment of the present invention, the presentation device, upon successful selection, is able to connect to the selected WPS unit with a user centric verification approach.

30

Accordingly, these objective and embodiments may be achieved by introducing the following elements.

The presentation device comprises an application comprising a user interface; a presentation device location broadcaster for detecting and broadcasting the location of the presentation device; a presentation device repository for storing and managing data; and a presentation device engine for streaming the contents of the presentation device to the connected WPS unit.

The WPS unit comprises a verifier for verifying the identity of the presentation device; a WPS location module for generating an adopted location technology signal that allows the WPS unit to be observed by the presentation device; a WPS unit repository for storing and managing data; and a WPS unit engine for receiving the streamed contents from the presentation device and forwarding the received streamed contents to the AV device.

It is another objective of the present invention to provide a method that allows at least one presentation device to correctly select and subsequently to connect to at least one WPS unit from an environment comprising a plurality of WPS units, with the purpose to stream contents of the presentation device to at least one AV device that is connected to the selected WPS unit.

In one embodiment of the present invention, the selection is made based on a proximity level of each WPS unit. The proximity level is defined by the distance between the location of the presentation device and the location of each WPS unit in the environment.

In another embodiment of the present invention, the presentation device, upon successful selection, is able to connect to the selected WPS unit with a user centric verification approach.

Accordingly, these objective and embodiments may be achieved by introducing the following steps.

In general, the method comprises three main steps of detecting and selecting the at least one WPS unit that is in close proximity to the presentation device;

negotiating access control and establishing a connection between the presentation device and the selected WPS unit; and initiating the streaming process.

- 5 In accordance with the above step of detecting and selecting the at least one WPS unit that is in close proximity to the presentation device, the step further comprises a step of a user accessing an application through a user interface residing in the presentation device. This action subsequently commands a presentation device location broadcaster residing in the presentation device to detect the location of
10 the presentation device, and send the detected location to the application. The application then cross checks the detected location against location records of WPS units that are stored in a presentation device repository residing in the presentation device, with the intention of determining the proximity level of each WPS unit in the environment. One or more of the WPS units is shortlisted based
15 on their proximity level. The application consequently cross checks the shortlisted WPS units against WPS selection rules records stored in the presentation device repository. Eventually, only the WPS units that are in close proximity to the presentation device and abide by the rules as stipulated in the WPS selection rules records are displayed in a final list by the application for the purpose of selection
20 by the user.

- In accordance with the above step of negotiating access control and establishing a connection between the presentation device and the selected WPS unit, the step further comprises a step of inputting a verification data by the user, and a step of
25 commanding the application to fetch verification records of users stored in the presentation device repository. Thereafter, the verification data is verified against the fetched verification records of users. Upon successful verification, the application further fetches credential records of WPS units stored in the presentation device repository for that selected WPS unit. The fetched credentials
30 allow the application to form a partial connection between the presentation device and the selected WPS unit. With the established partial connection, the application is able to forward the inputted verification data of the user to a verifier residing in the selected WPS unit. The verifier then verifies the received verification data

against verification records of users stored in a WPS unit repository residing in the selected WPS unit. Upon successful verification, the presentation device is then allowed to complete the partial connection with the selected WPS unit.

- 5 In accordance with the above step of initiating the streaming process, the step further comprises the application to receive a notification of successful connection that is issued from the verifier. The user is then able to input a start intent via the application. This action will trigger a presentation device engine residing in the presentation device to start streaming the contents to a WPS unit engine residing
- 10 in the selected WPS unit. Upon receiving the streamed contents, the WPS unit engine verifies the identity of the presentation device with the verifier. Once the verification is successful, the WPS unit engine will then forward the received streamed contents to the connected AV device.

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BRIEF DESCRIPTION OF THE DRAWINGS

The features of the invention will be more readily understood and appreciated from the following detailed description when read in conjunction with the accompanying drawings of the preferred embodiment of the present invention, in which:

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Figure 1 depicts the system of the present invention;

Figure 2 depicts the overall method of the present invention;

- 25 Figure 3 depicts the detailed method of detecting and selecting WPS unit that is in close proximity to a presentation device;

Figure 4 depicts the detailed method of negotiating access control and establishing a connection between the presentation device and the selected WPS

30 unit; and

Figure 5 depicts the detailed method of initiating the streaming process.

DETAILED DESCRIPTION OF THE INVENTION

The above mentioned and other features and objects of this invention will become more apparent and better understood by reference to the following detailed description. It should be understood that the detailed description made known
5 below is not intended to be exhaustive or limit the invention to the precise disclosed form as the invention may assume various alternative forms. On the contrary, the detailed description covers all the relevant modifications and alterations made to the present invention, unless the claims expressly state
10 otherwise.

The present invention teachings are related to a system for wirelessly connecting at least one presentation device (100) to at least one WPS unit (200) that is correctly selected from an environment comprising a plurality of WPS units (200).
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The presentation device (100) may comprise a computer, a laptop, a smartphone, a tablet computer, and the likes.

The environment may be defined as a room, a plurality of rooms, a campus, a hall,
20 an auditorium, a building with multiple rooms, an area having multiple buildings, and the likes.

The selection of the WPS unit (200) is based on location of the presentation device (100), location of each WPS unit (200) in the environment, and distance between
25 the location of the presentation device (100) and the location of each WPS unit (200). In brief, the WPS unit (200) that is in close proximity to the presentation device (100) is selected. This unique feature is discussed in depth later in this document.

30 After the selection, the system also comprises elements that allow the presentation device (100) to be connected to the selected WPS unit (200). Before the connection is made, the presentation device (100) undergoes a user centric verification process.

Upon completion of the connection, the presentation device (100) is then able to stream its contents to the selected WPS unit (200), which subsequently forwards the received streamed contents to at least one connected AV device.

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The contents may comprise audio contents, visual contents, or a combination thereof.

The AV device may comprise a projector, a television, a speaker, and the likes.

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A method for achieving the above-mentioned aims is also disclosed herein, and will be apparent with the followings.

Referring now to Figure 1, it is shown that the presentation device (100) comprises four important elements, which are an application (110) comprising a user interface for a user to use and to communication with other elements, a presentation device location broadcaster (120) for detecting the present location of the presentation device (100) and subsequently to broadcast the detected location to the application (110), a presentation device repository (130) for storing and managing data, and a presentation device engine (140) for streaming the contents of the presentation device (100) to the connected WPS unit (200).

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The presentation device location broadcaster (120) may comprise WiFi technology, Bluetooth technology such as Bluetooth low energy technology, radio technology such as ultra-wideband (UWB), and the likes.

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Still referring to Figure 1, it is shown that the WPS unit (200) comprises a verifier (210) for verifying identity of the presentation device (100) before the presentation device (100) is allowed to connect to the WPS unit (200), a WPS location module (220) for generating an adopted location technology signal that allow the WPS unit (200) to be observed by the presentation device (100), a WPS unit repository (230) for storing and managing data, and a WPS unit engine (240) for receiving the

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streamed contents from the presentation device engine (140) and subsequently to forward the received streamed contents to the connected AV device.

The WPS location module (220) may comprise WiFi technology, Bluetooth
5 technology such as Bluetooth low energy technology, radio technology such as ultra-wideband (UWB), and the likes.

The data that is stored and managed in the presentation device repository (130) comprises location records of WPS units (310), WPS selection rules records (320),
10 verification records of users (340), and credential records of WPS units (330). All these data are collected beforehand and preloaded in the presentation device repository (130) by an administrator.

The data that is stored and managed in the WPS unit repository (230) comprises
15 verification records of users (340), and credential records of WPS units (330). All these data are collected beforehand and preloaded in the WPS unit repository (230) by the administrator.

Optionally, all the above-mentioned data can be collected beforehand and stored,
20 by the administrator, in a central network server (300) that is connected to a network. The WPS units (200) in the environment are connected to the same network as the central network server (300). Apart from storing the data, the central network server (300) also manages the data in order to ensure that the data is always in sync with the data stored in the presentation device repository
25 (130) and the WPS unit repository (230). Alternatively, the data in the presentation device repository (130) and the data in the WPS unit repository (230) are synced and updated with the data stored in the central network server (300) upon being fetched by request. Additionally, the central network server (300) may comprise a user interface for system configuration (350), allowing the administrator to carry
30 out the management tasks on the central network server (300). The management tasks include collecting, storing, initialising, and maintaining data of verification records of users (340), credential records of WPS units (330), WPS selection rules records (320), and location records of WPS units (310) in the central network

server (300), and cascading said data to the presentation device (100), the WPS units (200), or both.

Referring to Figure 2, the method of the present invention comprises three main steps, *i.e.* detecting and correctly selecting the WPS unit (200) that is in close proximity to the presentation device (100) (400), negotiating access control and establishing a connection between the presentation device (100) and the selected WPS unit (200) (500), and initiating the streaming process (600).

10 Referring to Figure 3, the detailed information regarding the step of detecting and correctly selecting the WPS unit (200) that is in close proximity to the presentation device (100) (400).

Firstly, the user accesses the application (110) (401) and such action triggers the presentation device location broadcaster (120) to start detecting the location of the presentation device (100). Once the location is detected, the presentation device location broadcaster (120) then broadcasts the information to the application (110) (402).

20 Upon receiving the detected location, the application (110) proceeds to fetch the locations records of WPS units (310) stored in the presentation device repository (130) residing in the presentation device (100). Optionally, if the central network server (300) is deployed, the locations records of WPS units (310) in the presentation device repository (130) is synchronized and updated with the location records of WPS units (310) stored in the central network server (300), before the location records of WPS units (310) are sent to the application (110).

The location records of WPS units (310) comprises information relating to the location of each WPS unit (200) in the environment. As briefly mentioned above, 30 the locations of the plurality of WPS units (200) in the environment are collected by the administrator, logged as the location records of WPS units (310), and stored in the presentation device repository (130).

Once the application (110) is in receipt of the fetched locations records of WPS units (310), it will then cross check the detected location with the fetched data with the aim to determine a proximity level for each WPS unit (200) in the environment (403). The proximity level is defined as the distance from the presentation device (100) to each WPS unit (200). In one embodiment, a WPS unit (200) is concluded to be in close proximity to the presentation device (100) when its proximity level does not exceed a certain threshold. For example, a WPS unit (200) is concluded to be in close proximity to the presentation device (100) when its distance to the presentation device (100) is 4 meters, which does not exceed a threshold of 5 meters. In another embodiment, a WPS unit (200) is concluded to be in close proximity to the presentation device (100) when it has the lowest proximity level compared with the proximity level of other WPS units (200).

From the location cross checking results, one or more of the WPS units (200) is shortlisted. The application (110) then fetches the WPS selection rules records (320) stored in the presentation device repository (130). Optionally, if the central network server (300) is deployed, the WPS selection rules records (320) in the presentation device repository (130) are synchronized and updated with the WPS selection rules records (320) stored in the central network server (300), before the WPS selection rules records (320) are being sent to the application (110).

The WPS selection rules records (320) comprise rules that must be complied by the shortlisted WPS units (200). For example, the rules state that out of all the shortlisted WPS units (200), only the WPS units (200) that are physically in the same room as the presentation device (100) will be further shortlisted. In another example, the rules state that the presentation device (100) is able to make connection to all the shortlisted WPS units (200) that are in the same room. These are only a few examples, and other rules may be employed in accordance with how and where the present invention is intended to be use. The WPS units (200) that are found to be in compliance with the rules are further shortlisted for final selection by the user.

Soon after the application (110) is in receipt of the WPS selection rules records (320), the application (110) consequently cross checks the shortlisted WPS units (200) against the rules of the WPS selection rules records (320) (404). Eventually, only the WPS units (200) that are in close proximity to the presentation device (100) and abide by the rules as stipulated in the WPS selection rules records (320) are further shortlisted and displayed in a final list by the application (110) for the purpose of selection by the user (405).

In one embodiment of the present invention, the WPS selection rules records (320) further comprise connection history between the presentation device (100) and the plurality of WPS units (200) in the environment. The application (110) uses this particular information to determine the frequency of connection between the presentation device (100) and the shortlisted WPS units (200), and subsequently to provide an auto-select function to select a particular WPS unit (200) that has the highest frequency of connection.

Referring to Figure 4, the detailed information regarding the step of negotiating access control and establishing a connection between the presentation device (100) and the selected WPS unit (200) (500) will be thoroughly described herein with the aid of said figure.

The user is able to make his or her selection of the desired WPS unit (200) from the final list as compiled and presented by the application (110). Upon selection, this action triggers the application (110) to request the user to input his or her verification data (501). The verification process is user centric, and therefore, the verification data may comprise password verification, pin verification, pattern verification, biometric verification, or any combination thereof. The biometric verification may further comprise face recognition, fingerprint recognition, voice recognition, and the likes.

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When the application (110) is in receipt of the verification data, it will proceed to fetch the verification records of users (340) stored in the presentation device repository (130) (501). Optionally, if the central network server (300) is deployed,

the verification records of users (340) in the presentation device repository (130) is synchronized and updated with the verification records of users (340) stored in the central network server (300), before the verification records of users (340) are sent to the application (110).

5

As previously mentioned, the verification records of users (340) are collected beforehand and preloaded in the presentation device repository (130) and the WPS unit repository (230). Therefore, the user and any other future users that wish to use the teaching of the present must first be enrolled. The enrolment process is conducted by the administrator for collecting and storing personal data of the users into the verification records of users (340). The personal data may comprise name, age, address, verification data as mentioned above, and any other data, for example affiliated and allowed presentation devices, *etc.*, that may be deemed to be necessary in order for the present invention to work as intended.

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Upon receiving the verification records of users (340), the application (110) proceeds to verify the verification data against the verification records of users (340) (501).

20 Once the verification is successful, the application (110) then fetches the credential records of WPS units (330) stored in the presentation device repository (130) for the selected WPS unit (200) (502). Optionally, if the central network server (300) is deployed, the credential records of WPS units (330) in the presentation device repository (130) is synchronized and updated with the credential records of WPS units (330) stored in the central network server (300),
25 before the credential records of WPS units (330) are sent to the application (110).

With the credentials from the credential records of WPS units (330), the application (110) is able to make a partial connection or a restricted connection between the presentation device (100) and the selected WPS unit (200) (502). With the partial or restricted connection established, the presentation device (100) and the selected WPS unit (200) are connected to each other for the purpose of verification.
30 At this point, the streaming function is still not allowed yet.

The application (110) subsequently forwards the verification data previously provided by the user to the verifier (210) residing in the selected WPS unit (200) for further verification (503). When the verifier (210) is in receipt of the verification data, it then proceeds to fetch the verification records of users (340) stored in the WPS unit repository (230) residing in the WPS unit (200). Optionally, if the central network server (300) is deployed, the verification records of users (340) in the WPS unit repository (230) is synchronized and updated with the verification records of users (340) stored in the central network server (300), before the verification records of users (340) are sent to the verifier (210).

With the fetched verification records of users (340), the verifier (210) is then able to verify the received verification data (504), and subsequently to allow the partial or restricted connection to be completed between the presentation device (100) and the selected WPS unit (200) upon successful verification (505).

Referring now to Figure 5, the detailed information regarding the step of initiating the streaming process (600) will be thoroughly described herein with the aid of said figure.

When the connection is completed, the verifier (210) sends a notification of successful connection to the application (110) (601). The application (110) then provides an option for the user to input a start intent in order to trigger the presentation device engine (140) residing in the presentation device (100) to start streaming the contents of the presentation device (100) to the WPS unit engine (240) residing in the wirelessly connected WPS unit (200) (602).

Upon receiving the streamed contents from the presentation device engine (140), the WPS unit engine (240) performs another round of verification to ensure that the streaming presentation device (100) is the previously verified one. This verification is performed by having the WPS unit engine (240) verifying the identity of the presentation device (100) with the verifier (210) (603). Once verified, the

WPS unit engine (240) then forwards the received streamed contents to the connected AV device (604).

CLAIMS

- 1) A system for wirelessly connecting at least one presentation device (100) to at least one wireless presentation system, WPS, unit (200) selected from an environment that comprises a plurality of WPS units (200) based on its proximity level in order to stream contents of the presentation device (100), via the selected WPS unit (200), to at least one audio visual, AV, device that is connected to the selected WPS unit (200),
- wherein the presentation device (100) comprises:
- a) an application (110) comprising a user interface;
 - b) a presentation device location broadcaster (120) for detecting and broadcasting location of the presentation device (100);
 - c) a presentation device repository (130) for storing and managing data; and
 - d) a presentation device engine (140) for streaming the contents of the presentation device (100) to the connected WPS unit (200);
- the system is characterized by the WPS unit (200) comprises:
- e) a verifier (210) for verifying identity of the presentation device (100);
 - f) a WPS location module (220) for generating an adopted location technology signal that allows the WPS unit (200) to be observed by the presentation device (100);
 - g) a WPS unit repository (230) for storing and managing data; and
 - h) a WPS unit engine (240) for receiving the streamed contents from the presentation device (100), and forwarding the received streamed contents to the AV device.
- 2) The system in accordance with claim 1, wherein the data stored in the presentation device repository (130) comprises:

- a) verification records of users (340);
- b) credential records of WPS units (330);
- c) location records of WPS units (310); and
- d) WPS selection rules records (320).

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- 3) The system in accordance with claim 1, wherein the data stored in the WPS unit repository (230) comprises:

- a) verification records of users (340); and
- b) credential records of WPS units (330).

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- 4) The system in accordance with claim 1 further comprises a central network server (300) that stores and manages data that is always in sync with the data stored in the presentation device repository (130) and the WPS unit repository (230).

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- 5) The system in accordance with claim 4, wherein the data stored in the central network server (300) comprises:

- a) a user interface for system configurations (350);
- b) verification records of users (340);
- c) credential records of WPS units (330);
- d) location records of WPS units (310); and
- e) WPS selection rules records (320).

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- 6) A method for wirelessly connecting at least one presentation device (100) to at least one wireless presentation system, WPS, unit (200) selected from an environment that comprises a plurality of WPS units (200) in order to stream contents of the presentation device (100) to at least one audio visual, AV, device that is connected to the selected WPS unit (200), the method comprises:

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- a) detecting and selecting the at least one WPS unit (200) that is in close proximity to the presentation device (100) (400);
- b) negotiating access control and establishing a connection between the presentation device (100) and the selected WPS unit (200) (500); and
- 5 c) initiating the streaming process (600),

wherein, the method is characterized by the steps of:

- 10 d) the step of detecting and selecting the at least one WPS unit (200) that is in close proximity to the presentation device (100) (400) further comprises:
 - i) accessing an application (110) through a user interface residing in the presentation device (100) by a user (401);
 - 15 ii) detecting the location of the presentation device (100) and sends the detected location to the application (110) by a presentation device location broadcaster (120) (402);
 - iii) cross checking the detected location against locations records of WPS units (310) stored in a presentation device repository (130) residing in the presentation device (100) by the application (110) in order to determine a proximity level for each WPS unit (200) in the environment (403);
 - 20 iv) cross checking the WPS units (200) that are in close proximity to the presentation device (100) based on the determined proximity level against WPS selection rules records (320) stored in the presentation device repository (130) by the application (110) (404); and
 - 25 v) displaying a list of WPS units (200) that are in close proximity to the presentation device (100) and comply with the rules of the WPS selections rules records (320) by the application (110) for selection by the user (405);
 - 30

e) the step of negotiating access control and establishing a connection between the presentation device (100) and the selected WPS unit (200) (500) further comprises:

- 5 i) inputting verification data by the user (501);
- ii) fetching verification records of users (340) stored in the presentation device repository by the application (110) (130);
- iii) verifying the verification data against the fetched verification records of users (340) by the application (110) (501);
- 10 iv) fetching credential records of WPS units (330) stored in the presentation device repository (130) for the selected WPS unit (200) by the application (110) (502);
- v) making a partial connection between the presentation device (100) and the selected WPS unit (200) with the fetched credentials by the application (110) (502);
- 15 vi) forwarding the verification data provided by the user to a verifier (210) residing in the selected WPS unit (200) by the application (110) (503);
- vii) fetching the verification records of users (340) stored in a WPS unit repository (230) residing in the selected WPS unit (200) by the verifier (210);
- 20 viii) verifying the received verification data against the fetched verification records of users (340) by the verifier (210) (504); and
- ix) allowing the presentation device (100) to complete the connection to the selected WPS unit (200) by the verifier (210) (505);
- 25

f) the step of initiating the streaming process (600) further comprises:

- i) receiving a notification of successful connection by the application (110) from the verifier (210) (601);
- 30 ii) inputting a start intent via the application (110) by the user to trigger a presentation device engine (140) residing in the presentation device (100) to stream the contents of the

- presentation device (100) to a WPS unit engine (240) residing in the connected WPS unit (200) (602);
- iii) receiving the streamed contents by the WPS unit engine (240);
- iv) verifying identity of the presentation device (100) with the verifier (210) by the WPS unit engine (240) (603); and
- 5 v) forwarding the received streamed contents to the AV device by the WPS unit engine (240) (604).
- 7) The method in accordance with claim 6, wherein the locations of the plurality of WPS units (200) in the environment are collected by an administrator, logged as the location records of WPS units (310), and stored in the presentation device repository (130).
- 10
- 8) The method in accordance with claim 6, wherein the WPS selection rules records (320) comprise connection history between the presentation device (100) and the plurality of WPS units (200) that are in close proximity, which subsequently allows the application (110) to provide an auto-select function to select a particular WPS unit (200) based on frequency of the connection.
- 15
- 9) The method in accordance with claim 6, wherein the verification data is user centric and comprises password verification, pin verification, pattern verification, biometric verification, or any combinations thereof.
- 20
- 10) The method in accordance with claim 6 is further comprises of storing and managing the verification records of users (340), the credential records of WPS units (330), the location records of WPS units (310), and the WPS selection rules records (320) in a central network server (300).
- 25
- 11) The method in accordance with claim 10, wherein the central network server (300) is connected to the same network as the WPS units (200), and always in sync with the verification records of users (340), the credential records of WPS units (330), the location records of WPS units (310), and WPS selection rules records (320) stored in the presentation device repository (130).
- 30

- 12) The method in accordance with claim 10, wherein the central network server (300) is connected to the same network as the WPS units (200), and always in sync with the verification records of users (340), and the credential records
5 of WPS units (330) stored in the WPS unit repository (230).

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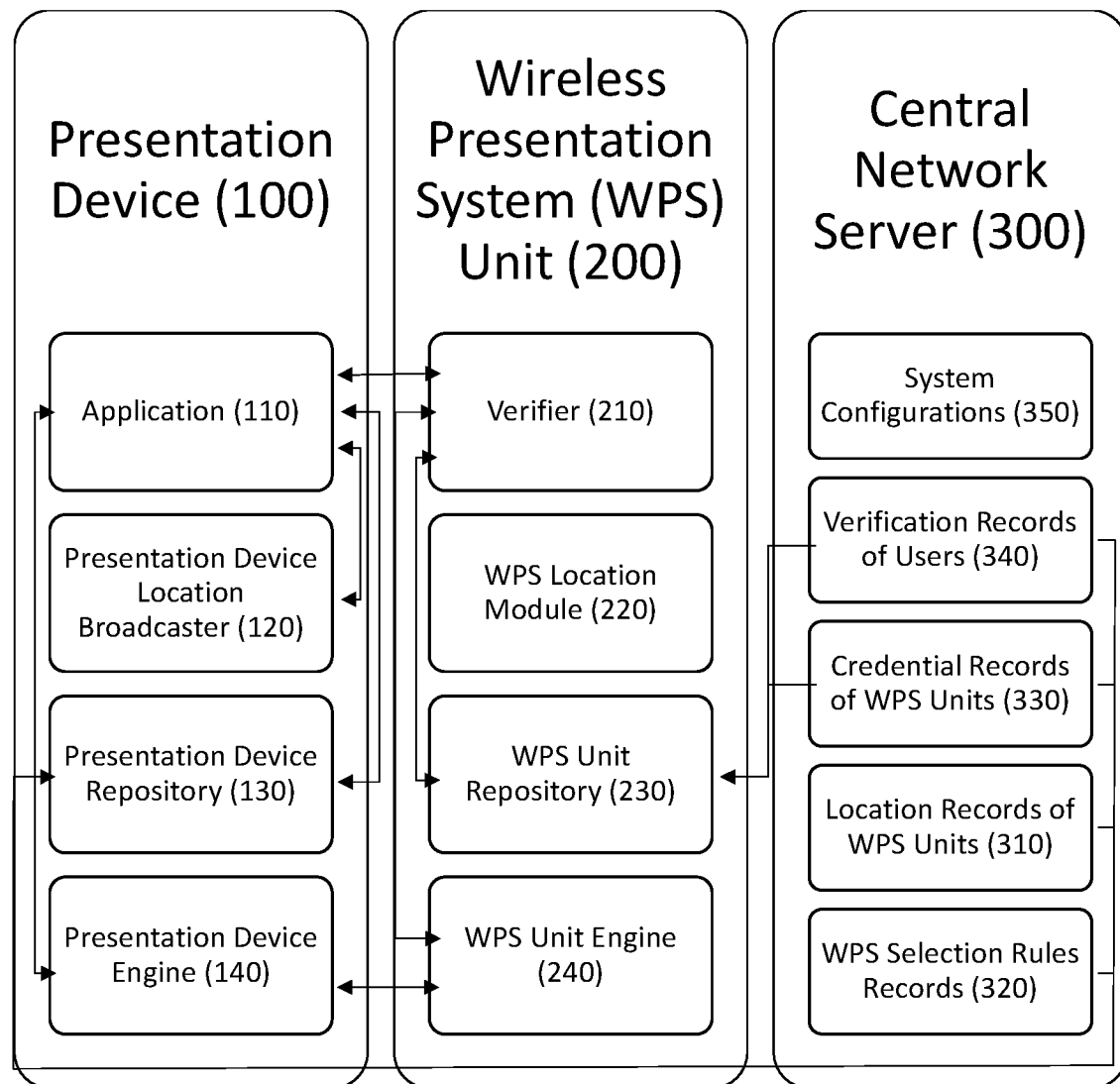


FIGURE 1

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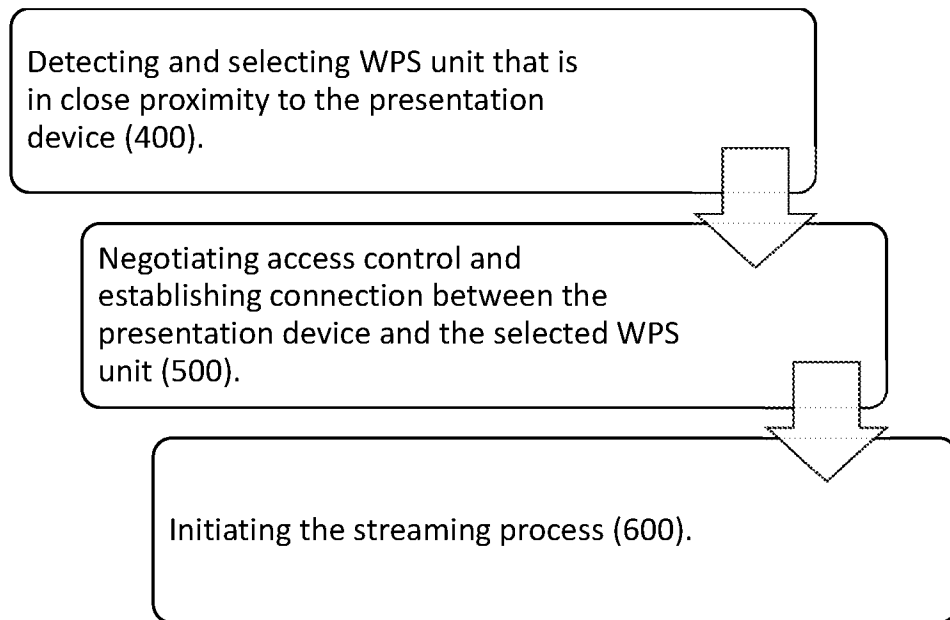


FIGURE 2

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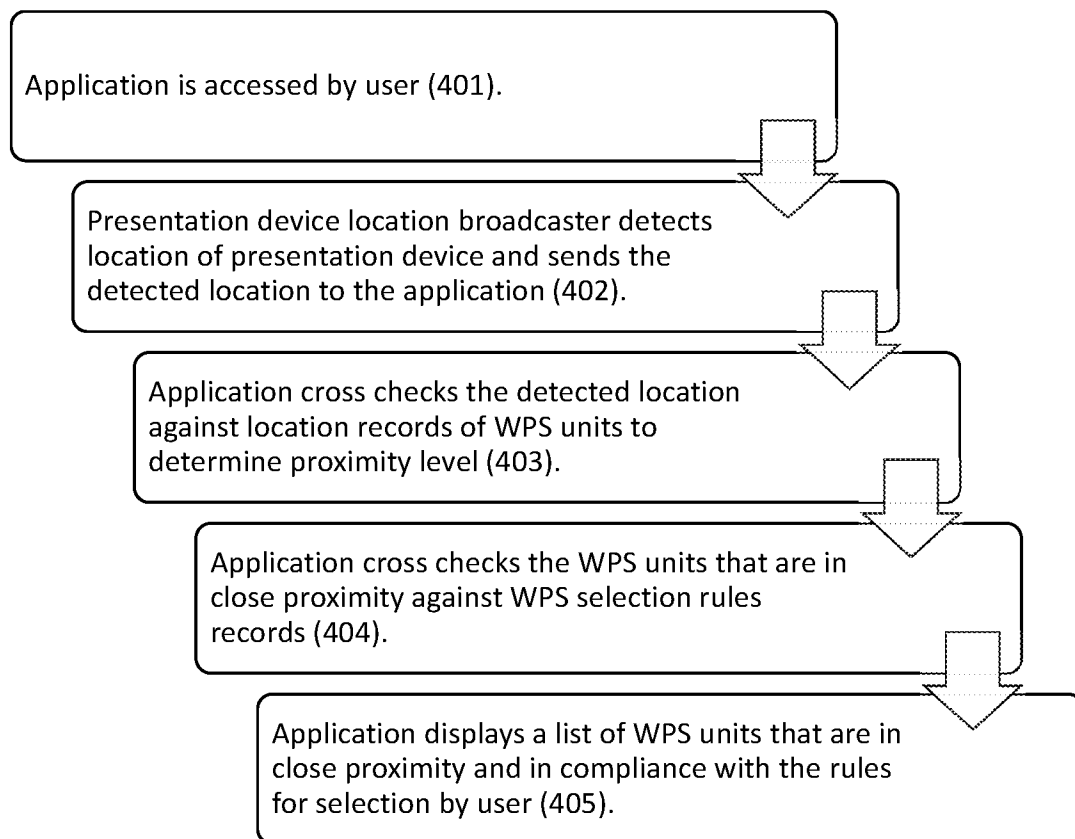


FIGURE 3

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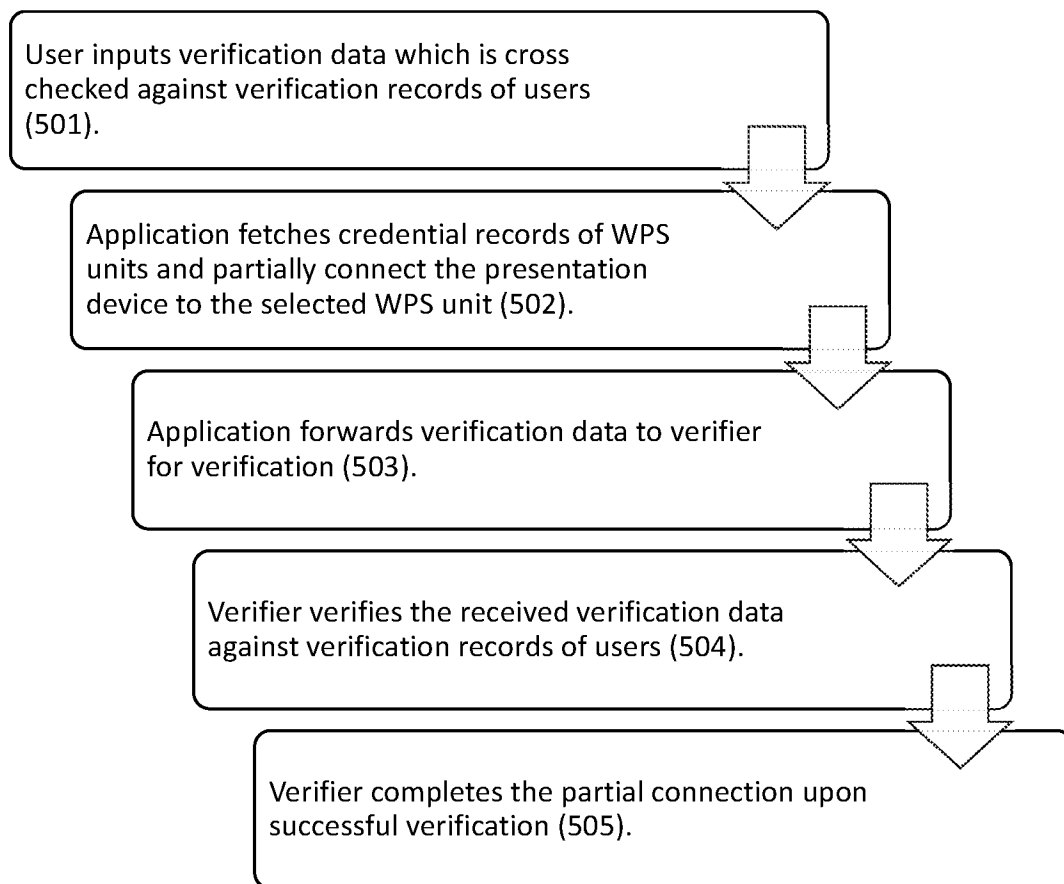


FIGURE 4

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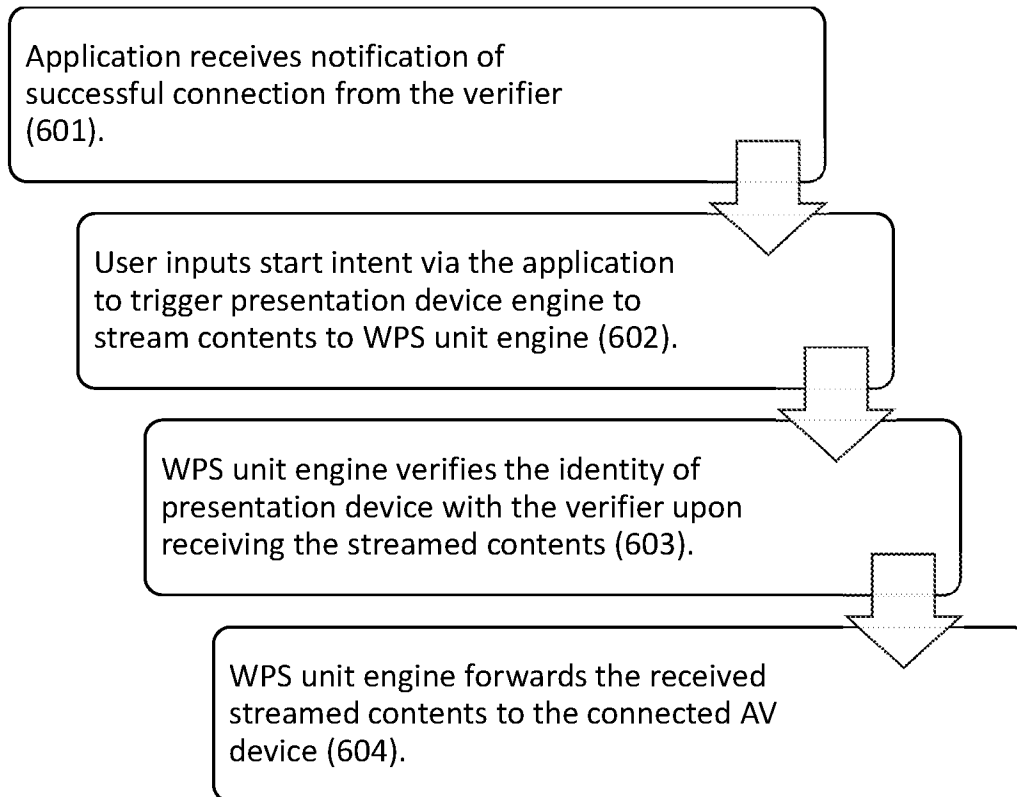


FIGURE 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/MY2020/050164

A. CLASSIFICATION OF SUBJECT MATTER

H04W 48/04(2009.01)i; **H04W 48/20**(2009.01)i; **H04W 48/16**(2009.01)i; **H04W 12/069**(2021.01)i; **H04W 12/63**(2021.01)i;
H04W 12/37(2021.01)i; **H04W 4/30**(2018.01)i; **H04L 29/08**(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04W 48/04(2009.01); G06Q 10/10(2012.01); G08B 1/08(2006.01); H04W 4/02(2009.01); H04W 64/00(2009.01);
H04W 76/02(2009.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: WPS(wireless presentation system), location, proximity, verifying, identity, streaming

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2015-0094093 A1 (SAMSUNG ELECTRONICS CO., LTD.) 02 April 2015 (2015-04-02) paragraphs [0025], [0051], [0072]-[0138], [0182]-[0183], [0253]; and figures 1-5	1-12
A	US 2014-0141725 A1 (RONALD D. JESME et al.) 22 May 2014 (2014-05-22) paragraphs [0023]-[0050]; and figures 1-8	1-12
A	WO 2014-189706 A2 (CITRLX SYSTEMS, INC.) 27 November 2014 (2014-11-27) paragraphs [0025]-[0168]; and figures 1-15C	1-12
A	US 2011-0254683 A1 (ERIC R. SOLDAN et al.) 20 October 2011 (2011-10-20) paragraphs [0015]-[0059]; and figures 1-5	1-12
A	US 2005-0036509 A1 (SHRIKANT ACHARYA et al.) 17 February 2005 (2005-02-17) paragraphs [0036]-[0127]; and figures 1-30	1-12



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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“&” document member of the same patent family

Date of the actual completion of the international search

25 March 2021

Date of mailing of the international search report

26 March 2021

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/MY2020/050164

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				US 2019-0173745	A1	06 June 2019
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				CN 102202192	B	25 June 2014
				US 8638222	B2	28 January 2014
US	2005-0036509	A1	17 February 2005	US 7434166	B2	07 October 2008