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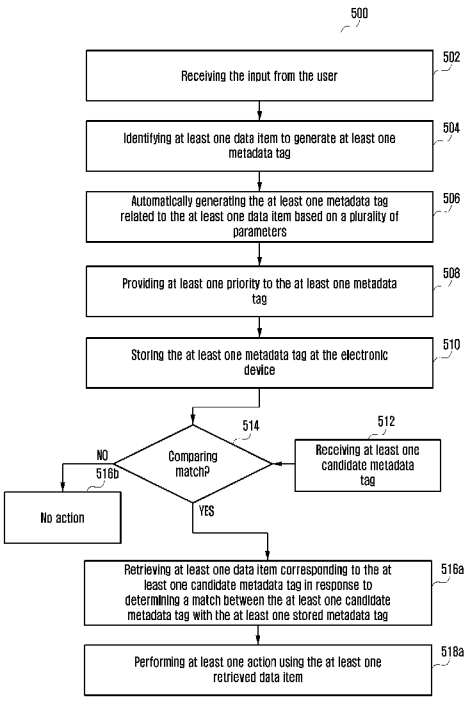

(57) Abstract: Accordingly, embodiments herein disclose a method and apparatus for retrieving intelligent information from an electronic device (100). The method includes receiving, by the electronic device (100), an input from a user. Further, the method includes identifying, by the electronic device (100), at least one data item to generate at least one metadata tag. Further, the method includes automatically generating, by the electronic device (100), the at least one metadata tag related to the at least one data item based on a plurality of parameters. Further, the method includes providing, by the electronic device (100), at least one priority to the at least one metadata tag. Further, the method includes storing, by the electronic device (100), the at least one metadata tag at the electronic device (100).

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Description

Title of Invention: METHOD AND APPARATUS FOR RETRIEVING INTELLIGENT INFORMATION FROM ELECTRONIC DEVICE

Technical Field

[1] The present disclosure relates to machine learning (ML) and artificial intelligence (AI), and more specifically related to a method and apparatus for retrieving intelligent information from an electronic device.

Background Art

[2] In general, a user has a large amount of data in an electronic device (e.g. data item such as captured pictures, screenshots, web browsing, and call recording) (as shown in FIG. 1). Each time the user wants to access for example a specific image/ data, then the user has to scan for specific information/relevant data manually from the large amount of data contained in the electronic device. There is no easy way to smartly retrieve such data in an existing system and the existing methods can be cumbersome and may hamper user experience. Since, finding the relevant data is an important task, the issues in the existing system need to be addressed. To address the task, collaboration between data retrieval techniques, machine learning (ML) and artificial intelligence (AI) is needed.

[3] Thus, it is desired to address the above mentioned disadvantages or other shortcomings or at least provide a useful alternative.

Disclosure of Invention

Technical Problem

[4] The principal object of the embodiments herein is to provide a method and apparatus for retrieving intelligent information from an electronic device.

[5] Another object of the embodiments is to receive an input from a user and identify at least one data item to generate at least one metadata tag.

[6] Another object of the embodiments is to automatically generate the at least one metadata tag related to the at least one data item based on a plurality of parameters and provide at least one priority to the at least one metadata tag.

[7] Another object of the embodiments is to receive at least one candidate metadata tag and compare at least one candidate metadata tag with the at least one stored metadata tag.

[8] Another object of the embodiments is to retrieve at least one data item corresponding to the at least one candidate metadata tag in response to determining a match between

the at least one candidate metadata tag with the at least one stored metadata tag and perform at least one action using the at least one retrieved data item.

Solution to Problem

[9] Accordingly, embodiments herein disclose a method and apparatus for retrieving intelligent information from an electronic device. The method includes receiving, by the electronic device, a direct input or indirect input (e.g. taking a screenshot) from a user. Further, the method includes identifying, by the electronic device, at least one data item to generate at least one metadata tag. Further, the method includes automatically generating, by the electronic device, the at least one metadata tag related to the at least one data item based on a plurality of parameters. Further, the method includes providing, by the electronic device, at least one priority to the at least one metadata tag. Further, the method includes storing, by the electronic device, the at least one metadata tag at the electronic device.

[10] In an embodiment, the method further comprises receiving, by the electronic device, at least one candidate metadata tag. Further, the method includes comparing, by the electronic device, the at least one candidate metadata tag with the at least one stored metadata tag. Further, the method includes retrieving, by the electronic device, at least one data item corresponding to the at least one candidate metadata tag in response to determining a match between the at least one candidate metadata tag with the at least one stored metadata tag. Further, the method includes performing, by the electronic device, at least one action using the at least one retrieved data item.

[11] In an embodiment, the at least one data item is retrieved based on the priority associated with the at least one candidate metadata tag.

[12] In an embodiment, the method includes identifying, by the electronic device, at least one of an image block, a text block, and an audio block available in the data item. Further, the method includes determining, by the electronic device, the plurality of parameters associated with the at least one of the image block, text block, and audio block. Further, the method includes generating, by the electronic device, the at least one metadata tag related to the at least one data item based on the plurality of parameters.

[13] In an embodiment, the plurality of parameters of image block comprises at least one of scene object block, expression block, face block, and activity block.

[14] In an embodiment, the plurality of parameters of text block comprises at least one of a keyword block, a language identification block, a classification block, a text summary block, and an electronic device content aggregator block.

[15] In an embodiment, the plurality of parameters of audio block comprises at least one of audio summary and language identification.

[16] In an embodiment, the electronic device locally generates the at least one metadata tag without interacting with any network devices.

[17] In an embodiment, the at least one metadata tag is customizable by the user.

[18] In an embodiment, the at least one data item comprises an image file, a video file, an audio file, and a text document.

[19] Accordingly, the embodiments herein provide an electronic device for retrieving intelligent information. The electronic device includes a processor and a memory. The processor is configured to receive an input from a user. Further, the processor is configured to identify at least one data item to generate at least one metadata tag. Further, the processor is configured to automatically generate the at least one metadata tag related to the at least one data item based on a plurality of parameters. Further, the processor is configured to provide at least one priority to the at least one metadata tag. Further, the processor is configured to store the at least one metadata tag at the electronic device.

[20] These and other aspects of the embodiments herein will be better appreciated and understood when considered in conjunction with the following description and the accompanying drawings. It should be understood, however, that the following descriptions, while indicating preferred embodiments and numerous specific details thereof, are given by way of illustration and not of limitation. Many changes and modifications may be made within the scope of the embodiments herein without departing from the spirit thereof, and the embodiments herein include all such modifications.

Advantageous Effects of Invention

[21] According to various embodiments, the electronic device may provide for retrieving intelligent information from an electronic device. According to various embodiments, it may be possible to receive an input from a user and identify at least one data item to generate at least one metadata tag. According to various embodiments, it may be possible to automatically generate the at least one metadata tag related to the at least one data item based on a plurality of parameters and provide at least one priority to the at least one metadata tag.

Brief Description of Drawings

[22] This method is illustrated in the accompanying drawings, throughout which like reference letters indicate corresponding parts in the various figures. The embodiments herein will be better understood from the following description with reference to the drawings, in which:

[23] FIG. 1 illustrates an existing search system for particular data for quick reference or share with at least one second user by an electronic device, according to a prior art disclosed herein;

[24] FIG. 2 illustrates a block diagram of the electronic device to retrieve intelligent information, according to an embodiment as disclosed herein;

[25] FIGS. 3A and 3B are a flow diagram illustrating a method to generate metadata tag in the electronic device, according to an embodiment as disclosed herein;

[26] FIGS. 4A, 4B, 4C, and 4D are an example illustration of the method to generate metadata tag in the electronic device, according to an embodiment as disclosed herein;

[27] FIG. 5 is a flow diagram illustrating a method used to retrieve the intelligent information from the electronic device, according to an embodiment as disclosed herein;

[28] FIGS. 6A, 6B, and 6C are an example illustration of a smart metadata tags and summarization of textual content using a virtual assistant of the electronic device to retrieve the intelligent information, according to an embodiment as disclosed herein;

[29] FIGS. 7A, 7B, 7C, and 7D are another example illustration of the smart metadata tags and summarization generated for a browser application of the electronic device, according to an embodiment as disclosed herein;

[30] FIGS. 8A, 8B, and 8C are another example illustration to generate metadata tags based on image feature, according to an embodiment as disclosed herein;

[31] FIGS. 9A, 9B, and 9C are another example illustration to generate metadata tags for a ride service application of the electronic device, according to an embodiment as disclosed herein;

[32] FIGS. 10A to 10F are another example illustration to learn intelligent properties of the smart summarizer to generate metadata tags for the browser application of the electronic device, according to an embodiment as disclosed herein;

[33] FIGS. 11A, 11B, 11C, and 11D are another example illustration to generate metadata tags created for incoming call, according to an embodiment as disclosed herein;

[34] FIGS. 12A, 12B, 12C, and 12D are another example illustration of the smart summarizer generated on the basis of conversation summary for a message application of the electronic device, according to an embodiment as disclosed herein;

[35] FIGS. 13A, 13B, 13C, and 13D are another example illustration to generate metadata tags for a recorder application of the electronic device, according to an embodiment as disclosed herein;

[36] FIGS. 14A, 14B, and 14C are another example illustration of smart compose generated for the message application of the electronic device, according to an embodiment as disclosed herein; and

[37] FIGS. 15A and 15B are another example illustration of smart reply, smart share and smart compose generated on the basis of received Uniform Resource Locator (URL) for the message application of the electronic device, according to an embodiment as disclosed herein.

Mode for the Invention

[38] The embodiments herein and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments that are illustrated in the accompanying drawings and detailed in the following description. Descriptions of well-known components and processing techniques are omitted so as to not unnecessarily obscure the embodiments herein. Also, the various embodiments described herein are not necessarily mutually exclusive, as some embodiments can be combined with one or more other embodiments to form new embodiments. The term "or" as used herein, refers to a non-exclusive or, unless otherwise indicated. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiments herein can be practiced and to further enable those skilled in the art to practice the embodiments herein. Accordingly, the examples should not be construed as limiting the scope of the embodiments herein.

[39] As is traditional in the field, embodiments may be described and illustrated in terms of blocks which carry out a described function or functions. These blocks, which may be referred to herein as units or modules or the like, are physically implemented by analog or digital circuits such as logic gates, integrated circuits, microprocessors, microcontrollers, memory circuits, passive electronic components, active electronic components, optical components, hardwired circuits, or the like, and may optionally be driven by firmware and software. The circuits may, for example, be embodied in one or more semiconductor chips, or on substrate supports such as printed circuit boards and the like. The circuits constituting a block may be implemented by dedicated hardware, or by a processor (e.g., one or more programmed microprocessors and associated circuitry), or by a combination of dedicated hardware to perform some functions of the block and a processor to perform other functions of the block. Each block of the embodiments may be physically separated into two or more interacting and discrete blocks without departing from the scope of the invention. Likewise, the blocks of the embodiments may be physically combined into more complex blocks without departing from the scope of the invention

[40] The accompanying drawings are used to help easily understand various technical features and it should be understood that the embodiments presented herein are not limited by the accompanying drawings. As such, the present disclosure should be construed to extend to any alterations, equivalents and substitutes in addition to those which are particularly set out in the accompanying drawings. Although the terms first, second, etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are generally only used to distinguish one element from another.

[41] Accordingly, embodiments herein disclose a method and apparatus for retrieving intelligent information from an electronic device. The method includes receiving, by the electronic device, a direct input or indirect input from a user. Further, the method includes identifying, by the electronic device, at least one data item to generate at least one metadata tag. Further, the method includes automatically generating, by the electronic device, the at least one metadata tag related to the at least one data item based on a plurality of parameters. Further, the method includes providing, by the electronic device, at least one priority to the at least one metadata tag. Further, the method includes storing, by the electronic device, the at least one metadata tag at the electronic device.

[42] Referring now to the drawings, and more particularly to FIGS. 2 through 15, there are shown preferred embodiments.

[43] FIG. 2 illustrates a block diagram of an electronic device (100) to retrieve intelligent information, according to an embodiment as disclosed herein. The electronic device (100) can be, for example, but not limited to a smartphone, a laptop, a desktop, a smartwatch, a smart TV or a like. In an embodiment, the electronic device (100) includes a processor (120), a memory (130), a display (140), and a communicator (150).

[44] The processor (120) communicates with the memory (130), the display (140), and the communicator (150). The processor (120) is configured to execute instructions stored in the memory (130) and to perform various processes.

[45] In an embodiment, the processor (120) is configured to receive an input (e.g. by a gesture, touchscreen, vocal communication) from a user. Further, the processor (120) is configured to identify at least one data item (e.g. an image file, a video file, an audio file, and a text document) to generate at least one metadata tag (e.g. smart summarizer). Further, the processor (120) is configured to automatically generate the at least one metadata tag related to the at least one data item based on a plurality of parameters. Where the plurality of parameters uses knowledge graph. Further, the processor (120) is configured to provide at least one priority to the at least one metadata tag. Further, the processor (120) is configured to store the at least one metadata tag at the electronic device (100).

[46] In an embodiment, the processor (120) is configured to receive at least one candidate metadata tag (e.g. tag entered by the user). Further, the processor (120) is configured to compare the at least one candidate metadata tag with the at least one stored metadata tag. Further, the processor (120) is configured to retrieve at least one data item corresponding to the at least one candidate metadata tag in response to determining a match between the at least one candidate metadata tag with the at least one stored metadata tag. Further, the processor (120) is configured to perform at least one action (e.g. share

at least one data item with at least one-second user, store at least one data item in the electronic device (100)) using the at least one retrieved data item.

[47] In an embodiment, the at least one data item is retrieved based on the priority associated with the at least one candidate metadata tag.

[48] In an embodiment, the processor (120) is configured to identify at least one of an image block, a text block, and an audio block available in the data item. Further, the processor (120) is configured to determine the plurality of parameters associated with the at least one of the image block, text block, and audio block. Further, the processor (120) is configured to generate the at least one metadata tag related to the at least one data item based on the plurality of parameters.

[49] In an embodiment, the plurality of parameters of image block comprises at least one of scene object block (e.g. sand, flower, computer), expression block (e.g. funny, pout, surprise), face block (e.g. user`s face recognition), and activity block (e.g. running, dancing, sleeping, singing, swimming).

[50] In an embodiment, the plurality of parameters of text block comprises at least one of a keyword block (e.g. Seoul, Stark, 7$), a language identification block (e.g. Spanish, Hindi, Korean), a classification block, a text summary block (e.g. abstractive, extractive), and an electronic device content aggregator block (e.g. calendar information, weather information, location information, application category information, application metadata).

[51] In an embodiment, the plurality of audio block comprises at least one of audio summary, and language identification (e.g. Spanish, Hindi, Korean). The electronic device (100) locally generates the at least one metadata tag without interacting with any network devices. The at least one metadata tag is customizable by the user.

[52] In an embodiment, the processor (120) includes an input recognizer (121), a data item analysis engine (122), and a metadata tag generator (123).

[53] The input recognizer (121) receives the input from the user. The data item analysis engine (122) identifies at least one data item (e.g. at least one of the image, text, audio) to generate at least one metadata tag. The metadata tag generator (123) automatically generates the at least one metadata tag related to the at least one data item based on a plurality of parameters. Further, the metadata tag generator (123) includes an image processing engine (123a), a text localizer (123b), a script identifier (123c), an optical recognizer (123d), a language detector (123e), a keyword extraction engine (123f), a keyword expansion engine (123g), a knowledge graph (123h), and a voice engine (123i).

[54] The image processing engine (123a) performs a bilateral filter process on the image. Further, the image processing engine (123a) converts the bilateral image into a grayscale image. Further, the image processing engine (123a) performs a custom bina-

rization on the grayscale image. Further, the image processing engine (123a) extracts features from the image to generate feature tags. The text localizer (123b) determines text region/block in the grayscale image. The script identifier (123c) recognizes a script for determined text region of the grayscale image.

[55] The optical recognizer (123d) based on deep neural networks recognizes the text region and extracts the text from the image. Further, the language detector (123e) identifies language of the text for each script and stores identified language. The keyword extraction engine (123f) receives the extracted text from the optical recognizer (123d) in live pipeline, language details from the language detector (123e), and load language specific neural model to extract the most important part of the text. The keyword expansion engine (123g) adds new keywords in the current text, where the new keywords highly correlated, synonyms, or strongly related to the text. The knowledge graph (123h) determines rank of each keyword of the text based on the user personalized summary. The voice engine (123i) converts incoming voice signals into text and fed to the live pipeline to generate metadata tags on the electronic device (100).

[56] The memory (130) also stores instructions to be executed by the processor (120). The memory (130) may include non-volatile storage elements. Examples of such non-volatile storage elements may include magnetic hard discs, optical discs, floppy discs, flash memories, or forms of electrically programmable memories (EPROM) or electrically erasable and programmable (EEPROM) memories. In addition, the memory (130) may, in some examples, be considered a non-transitory storage medium. The term "non-transitory" may indicate that the storage medium is not embodied in a carrier wave or a propagated signal. However, the term "non-transitory" should not be interpreted that the memory (130) is non-movable. In some examples, the memory (130) can be configured to store larger amounts of information than the memory. In certain examples, a non-transitory storage medium may store data that can, over time, change (e.g., in Random Access Memory (RAM) or cache). In an embodiment, the memory (130) can be an internal storage unit or it can be an external storage unit of the electronic device (100), a cloud storage, or any other type of external storage.

[57] The memory (130) includes an application repository (130a) to store metadata tags of different candidate application (e.g., calling application, gallery application, camera application, business application, education application, lifestyle application, entertainment application, utility application, travel application, health and fitness application).

[58] The communicator (150) is configured for communicating internally between internal hardware components and with external devices via one or more networks.

[59] Although the FIG. 2 shows various hardware components of the electronic device

(100) but it is to be understood that other embodiments are not limited thereon. In other embodiments, the electronic device (100) may include less or more number of components. Further, the labels or names of the components are used only for illustrative purpose and does not limit the scope of the invention. One or more components can be combined together to perform same or substantially similar function to retrieve information intelligently.

[60] FIGS. 3A and 3B are a flow diagram illustrating a method to generate metadata tag in the electronic device (100), according to an embodiment as disclosed herein. The operations (302-324) are performed by the electronic device (100).

[61] The notation "a" indicates, at 302, the method includes identifying at least one image on the display (140). At 304, the method includes performing the bilateral filter process on the image. The bilateral filter process for edge-preserving smoothing. At 306, the method includes converting the bilateral image into the grayscale image. At 308, the method includes performing the custom binarization on the grayscale image. A detailed description of the custom binarization is given in notation "b". At 310, the method includes performing a text localization (i.e. on device text localization / not connected with external network), by the text localizer (123b), using a Canny edge detection. The Canny edge detection is used to measure edges of the horizontal and vertical axis present around the text region/block in the grayscale image. At 312, the method includes the script identification(i.e. on device script identification / not connected with external network), by the DNN based script identifier (123c), takes the text block as input and recognize a script (e.g. "Latin", "Cyrillic", "Chinese", "Japanese", "Korean", "Ashoka") of the text.

[62] At 314, optical character recognition (OCR), by the optical recognizer (123d), takes the custom binarization output and script identification output as an input. The optical recognizer (123d) is script dependent. Hence, the script identification is optimally loaded in the optical recognizer (123d) for making solution on the electronic device (100).Further, the script identification loaded necessary script resources for neural model for optical character recognition. The optical recognizer (123d) recognizes the text region and compares the text with databases, which consists of different types of character and extracts the text from the image using the DNN. At 316, the method includes automatically identifying language by the DNN based language detector (123e) (i.e. on device language detector / not connected with external network). Further, the identified language stored in the language detector (123e). For each script, there are multiple languages (e.g. Latin has more than 40 languages, Ashoka has more than 15 languages). Loading all languages leads to memory issue. To overcome the memory issue, the proposed system uses the language detector (123e) to add languages dynamically in the electronic device (100).

[63] At 318, the keyword extraction engine (123f) takes the language detector (123e) output and the optical recognizer (123d) output as an input. The keyword extraction engine (123f) is language-dependent, each language has its own set of grammar, and hence detecting language is important for identifying keywords correctly. The keyword extraction engine (123f) analysis the text and extract the most important texts from the text. This helps to summarize the content of the text and recognize the main topic.

[64] At 304a-306a, the feature extraction, by the image-processing engine (123a), uses DNN like convolution neural network (CNN) architecture to extract features from at least one image on the display (140) and generates tags based on the extracted feature.

[65] At 320, the keyword expansion engine (123g) module takes the extracted feature tag output and the keyword extraction engine (123f) output as an input. The keyword expansion engine (123g) is language-dependent. The keyword expansion engine (123g) adds new keywords in the current text, where the new keywords highly correlated, synonyms, or strongly related to the text in the text. At 322-324, ranking, by the knowledge graph (123), decides rank of each keyword of the text based on the user personalized summary.

[66] In an embodiment, the notation "b" indicates the custom binarization. At 308a, the method includes detecting edges using the canny edge on the grayscale image. At 308b, the method includes identifying contours by using the detected edges. With those contours, connected component is evaluated. At 308c, the method includes deciding contours processing have to proceed further or not. At 308da-308fa, the method includes processing on contours to add successfully into processing list. At 308db-308eb, the method includes calculating intensity of all neighborhood points and accordingly decision is taken to convert that pixel into white or black. To optimize, processing is done in four different threads which speed up the process of the custom binarization.

[67] FIGS. 4A, 4B, 4C, and 4D are an example illustration of the method to generate metadata tags in the electronic device (100), according to an embodiment as disclosed herein. The technical functionality is already explained in the FIGS. 3A and 3B.

[68] The user of the electronic device (100) searches for "Men dress" in the search browser and take screenshot of the displayed webpage. Screenshot can trigger a visual cue to user to initiate tag extraction or can directly trigger tag extraction. The method identifies the image of Men dress on the display (140) and perform various image processing operation at 304-308. At 310, the method detects text region of displayed item. At 312, the method is used to identify the script based on the detected text. At 314, the method recognize the text region such as "search", "Men dress", "latest", "GIF", "HD", "Product", "wedding", "casual", "party", "formal", "Men`s suit fashion", "amz.com", "hx.com", "go.com", "good.com". At 316, the method is used to

identify language based on the text region. In the example, the identified language is English.

[69] At 318, as notation "1", the method analysis the text region and extract the most important texts such as "search", "Men dress", "wedding", "casual", "party", "formal", "Men", "suit" , "fashion", "amz.com", "hx.com", "go.com", "good.com".

[70] At 304a-306a, the method extract features of displayed item and generates tags, as notation "2", such as "screenshot", "webpage", "Dress", "pattern". At 320, the method add new keywords such as "Clothes", "Garments", "Shirts", "Ring", "Marry", "Celebration", "Gathering", "Fun", "Screengrab", "design". At 322, the method rank of each keyword based on the user personalized summary. The notation "3" shows final text output / tags generated based on displayed item of the search browser.

[71] FIG. 5 is a flow diagram (500) illustrating a method used to retrieve the intelligent information from the electronic device (100), according to an embodiment as disclosed herein. The operations (502-518a) are performed by the electronic device (100).

[72] At 502, the method includes receiving the input from the user. At 504, the method includes identifying at least one data item to generate at least one metadata tag. At 506, the method includes automatically generating the at least one metadata tag related to the at least one data item based on a plurality of parameters. At 508, the method includes providing at least one priority to the at least one metadata tag. At 510, the method includes storing the at least one metadata tag at the electronic device (100). At 512-514, the method includes comparing the at least one candidate metadata tag with the at least one stored metadata tag. At 516b, the method includes performing no action when at least one candidate metadata tag does not match with the at least one stored metadata tag. At 516a, the method includes retrieving at least one data item corresponding to the at least one candidate metadata tag when at least one candidate metadata tag does match with the at least one stored metadata tag. At 518a, the method includes performing at least one action using the at least one retrieved data item.

[73] FIGS. 6A, 6B, and 6C are an example illustration of the smart metadata tags and summarization of textual content using a virtual assistant of the electronic device (100) to retrieve the intelligent information, according to an embodiment as disclosed herein.

[74] The notation "a" indicates that the virtual assistant analyzes screen (i.e. display (140)) content of the electronic device (100). In the example, the screen content is related to cricket news. The notation "b" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags, highlight cards) related to the screen content and the at least one metadata tag provides based on a priority of the user of the electronic device (100). In the example, the hashtags are "#CSK", "#SRH", "#IPL", "#Chepauk", and "#M Pandey". Further, the highlight cards are "M Pandey speaks up about match" and "Live from Chepauk". The generated

hashtags can be edited in an expand mode (e.g. add more hashtags) by the user of the electronic device (100) and the highlight cards give detailed summaries of the screen content to the user of the electronic device (100). Further, the electronic device (100) stores all or at least one of the hashtag and the highlight card selected / created by the user.

[75] The notation "c" indicates that the virtual assistant receives at least one candidate metadata tag. In the example, the candidate metadata tag is "#IPL". Then, the virtual assistant compares the candidate metadata tag with stored metadata tag and retrieves at least one data item (e.g. image, screenshot from the electronic device (100)) corresponding to the at least one candidate metadata tag.

[76] FIGS. 7A, 7B, 7C, and 7D are another example illustration of the smart metadata tags and summarization generated for a browser application of the electronic device (100), according to an embodiment as disclosed herein.

[77] The notation "a" indicates that the electronic device (100) receives the input (e.g. gesture, swipe) from the user of the electronic device (100). Then, the electronic device (100) analyzes screen content of the electronic device (100). In the example, the screen content is related to "India vs Australia". The notation "b" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags, highlight cards) related to the screen content and the at least one metadata tag provides based on priority of the user of the electronic device (100). In the example, the hashtags are "#cricket", "#India", "#Australia", "#test series", and "#Vir Kohli". Further, the highlight cards are "Victory on Australian soil" and "Special for bowlers". The generated hashtags and the highlight cards have the expand mode (i.e. by press 'More' button).

[78] The notation "c" indicates that the user of the electronic device (100) performs at least one of edit the generated hashtags / add new hashtags / save the hashtags in the electronic device (100). Further, the user of the electronic device (100) shares the hashtags with at least one-second user. The notation "d" indicates that the highlight cards give detailed summaries of the screen content to the user of the electronic device (100). Further, the electronic device (100) stores the highlight cards in the electronic device (100). Further, the user of the electronic device (100) shares the highlight cards with at least one-second user.

[79] FIGS. 8A, 8B, and 8C are another example illustration to generate metadata tags based on image feature, according to an embodiment as disclosed herein.

[80] The notation "a" indicates that the electronic device (100) receives the input from the user of the electronic device (100). Then, the electronic device (100) analyzes screen content of the electronic device (100). In the example, the screen content is an image. The notation "b" indicates that the electronic device (100) automatically generates the

at least one metadata tag (e.g. hashtags) related to the screen content and the at least one metadata tag provides based on priority of the user of the electronic device (100). In the example, the hashtags are "#beach", "#sand", "#sky", "#goa", "#sunset", "#people", "#horse", "#shadow", "#cloud", and "#water". The generated hashtags have the expand mode (i.e. by press 'More' button).

[81] The notation "c" indicates that the user of the electronic device (100) performs at least one of edit the generated hashtags / add new hashtags / save the hashtags in the electronic device (100). Further, the user of the electronic device (100) shares the hashtags with at least one-second user.

[82] FIGS. 9A, 9B, and 9C are another example illustration to generate metadata tags for a ride service application of the electronic device (100), according to an embodiment as disclosed herein.

[83] The notation "a" indicates that the electronic device (100) receives the input from the user of the electronic device (100). Then, the electronic device (100) analyzes screen content of the electronic device (100). In the example, the screen content is related to ride service information. The notation "b" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags) related to the screen content and the at least one metadata tag provides based on priority of the user of the electronic device (100). In the example, the hashtags are "#HSBC, Bannerghatta Main Rd", "#Royal Meenakshi Mall", "#i20", "#KA03CF9XXX", "#Mr. Jack", "#Total fare 70", and "#TTL1day". The generated hashtags have the expand mode (i.e. by press 'More' button). TTL1day is time to live one day, the TTL1day tag can be modified by the user of the electronic device (100). Further, TTL time is the time screenshot is available on the electronic device (100), after that the screenshot is automatically deleted which helps to keep the gallery organized and free of clutter.

[84] The notation "c" indicates that the user of the electronic device (100) performs at least one of edit the generated hashtags / add new hashtags / save the hashtags in the electronic device (100). Further, the user of the electronic device (100) shares the hashtags with at least one-second user.

[85] FIGS. 10A to 10F are another example illustration to learn intelligent properties of the smart summarizer to generate metadata tags for the browser application of the electronic device (100), according to an embodiment as disclosed herein.

[86] The notation "a" indicates that the electronic device (100) receives the input from the user of the electronic device (100). Then, the electronic device (100) analyzes screen content of the electronic device (100). In the example, the screen content is related to furniture images. The notation "b" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags) related to the screen content and the at least one metadata tag provides based on priority of the user of the

electronic device (100). In the example, the hashtags are "#furniture", "#room", "#sofa", "#table", "#chair", "#pfy.com", "#amz.com","# go.com" and "#good.com". The generated hashtags can be edited in the expand mode by the user of the electronic device (100). Further, the electronic device (100) stores the hashtags in the electronic device (100).

[87] The notation "c" indicates that receives the input (e.g. zoom) from the user of the electronic device (100). Then, the electronic device (100) analyzes screen content of the electronic device (100). In the example, the screen content is related to the particular one image. The notation "d" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags) related to the screen content and the at least one metadata tag provides based on priority of the user of the electronic device (100). In the example, the hashtags are "#room", "#sofa", "#table","# lamp", "#window", "#"pillow", "#amz.com", and "#zoom". The generated hashtags can be edited in the expand mode by the user of the electronic device (100). Further, the electronic device (100) stores the hashtags in the electronic device (100).

[88] The notation "e" indicates that the electronic device (100) receives at least one candidate metadata tag. In the example, the candidate metadata tag is "#sofa". Then, the electronic device (100) compares the candidate metadata tag with stored metadata tag and retrieves at least one data item (i.e. furniture images) corresponding to the at least one candidate metadata tag.

[89] The notation "f" indicates that the electronic device (100) receives at least one candidate metadata tag. In the example, the candidate metadata tag is "#sofa" and "#zoom". Then, the electronic device (100) compares the candidate metadata tag with stored metadata tag and retrieves at least one data item (i.e. the particular one image and furniture images) corresponding to the at least one candidate metadata tag.

[90] FIGS. 11A, 11B, 11C, and 11D are another example illustration to generate metadata tags created for incoming call, according to an embodiment as disclosed herein.

[91] The notation "a" indicates that the electronic device (100) receives the input from the user of the electronic device (100). Then, the electronic device (100) analyzes voice content of an incoming voice call from unknown number. The notation "b" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags) related to the incoming voice call conversation and the at least one metadata tag provides based on priority of the user of the electronic device (100). In the example, the hashtags are "#3bhk", "#room", "#Krishna", "#jp Nagar", and "#reminder". The generated hashtags can be edited in the expand mode by the user of the electronic device (100). Further, the electronic device (100) stores the hashtags.

[92] The notation "c-d" indicates that the electronic device (100) receives at least one candidate metadata tag. In the example, the candidate metadata tag is "#3bhk". Then,

the electronic device (100) compares the candidate metadata tag with stored metadata tag and retrieves at least one data item (e.g. mobile phone number) corresponding to the at least one candidate metadata tag.

[93] FIGS. 12A, 12B, 12C, and 12D are another example illustration of the smart summarizer generated on the basis of a conversation summary for a message application of the electronic device (100), according to an embodiment as disclosed herein.

[94] The notation "a" indicates that the electronic device (100) receives the input from the user of the electronic device (100). Then, the electronic device (100) analyzes screen content of the electronic device (100). In the example, the screen content is related to an incoming voice call from Mr. Jack (i.e. second user). The notation "b" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags) related to the incoming voice call conversation and the at least one metadata tag provides based on priority of the user of the electronic device (100). In the example, the hashtags are "#abc station", "#airport", "# 07:30 am", and "#passport". The generated hashtags can be edited in the expand mode by the user of the electronic device (100). Further, the electronic device (100) stores the hashtags.

[95] The notation "c-d" indicates that message conversation between user of the electronic device (100) and Mr. Jack. The message conversation is related to the incoming voice call. When user of the electronic device (100) types "As discuss over a call", the electronic device (100) automatically retrieves the generated hashtag with actionable features (e.g. book cab, set alarm) and share with Mr. Jack.

[96] FIGS. 13A, 13B, 13C, and 13D are another example illustration to generate metadata tags for a recorder application of the electronic device (100), according to an embodiment as disclosed herein.

[97] The notation "a" indicates that the electronic device (100) receives the input from the user of the electronic device (100). Then, the electronic device (100) analyzes voice content related to a voice recording. The notation "b" indicates that the electronic device (100) automatically generates the at least one metadata tag (e.g. hashtags) related to the voice recording and the at least one metadata tag provides based on priority of the user of the electronic device (100). In the example, the hashtags are "#20th June", "#meeting 9 am", "#room-7", "#hotel Tj", and "#Saturday morning". The generated hashtags can be edited in the expand mode by the user of the electronic device (100). Further, the electronic device (100) stores the hashtags.

[98] The notation "c-d" indicates that the electronic device (100) receives at least one candidate metadata tag. In the example, the candidate metadata tag is "#hotel Tj". Then, the electronic device (100) compares the candidate metadata tag with stored metadata tag and retrieves at least one data item (i.e. Voice 002) corresponding to the

at least one candidate metadata tag.

[99] FIGS. 14A, 14B, and 14C are another example illustration of smart compose generated for the message application of the electronic device (100), according to an embodiment as disclosed herein.

[100] The notation "a" indicates that message conversation between user of the electronic device (100) and Mr. Jack. The message conversation is related to a lunch party. The notation "b-c" indicates that when user of the electronic device (100) types "#Mr. Jack", the electronic device (100) automatically retrieves suggestions (e.g. picture, document, video, and message) related to Mr. Jack. The user of the electronic device (100) selects at least one of suggestions and share with Mr. Jack. Where suggestions keeps referring based on number of metadata tags added.

[101] FIGS. 15A and 15B are another example illustration of smart reply, smart share and smart compose generated on the basis of received Uniform Resource Locator (URL) for the message application of the electronic device (100), according to an embodiment as disclosed herein.

[102] The notation "a" indicates that message conversation between user of the electronic device (100) and Mr. Jack. The user of the electronic device (100) receives URL from Mr. Jack. The electronic device (100) summarizes URL content and provides summarization sentence suggestions on typing "#".The notation "b" indicates that the electronic device (100) provides intelligent suggestions to share URL.

[103] In an embodiment, example given in the FIG. 8A ? FIG. 15B of metadata tag generation can be extended for the tag summarization also.

[104] The embodiments disclosed herein can be implemented using at least one software program running on at least one hardware device and performing network management functions to control the elements.

[105] The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of the embodiments as described herein.

[106]

Claims

[Claim 1] A method for retrieving intelligent information from an electronic device (100), comprising:
receiving, by the electronic device (100), an input from a user;
identifying, by the electronic device (100), at least one data item to generate at least one metadata tag;
automatically generating, by the electronic device (100), the at least one metadata tag related to the at least one data item based on a plurality of parameters;
providing, by the electronic device (100), at least one priority to the at least one metadata tag; and
storing, by the electronic device (100), the at least one metadata tag at the electronic device (100).

[Claim 2] The method as claimed in claim 1, further comprises:
receiving, by the electronic device (100), at least one candidate metadata tag;
comparing, by the electronic device (100), the at least one candidate metadata tag with the at least one stored metadata tag;
retrieving, by the electronic device (100), at least one data item corresponding to the at least one candidate metadata tag in response to determining a match between the at least one candidate metadata tag with the at least one stored metadata tag; and
performing, by the electronic device (100), at least one action using the at least one retrieved data item.

[Claim 3] The method as claimed in claim 2, wherein the at least one data item is retrieved based on the priority associated with the at least one candidate metadata tag.

[Claim 4] The method as claimed in claim 1, wherein automatically generating, by the electronic device (100), the at least one metadata tag related to the at least one data item based on a plurality of parameters comprises:
identifying, by the electronic device (100), at least one of an image block, a text block, and an audio block available in the data item;
determining, by the electronic device (100), the plurality of parameters associated with the at least one of the image block, text block, and audio block; and
generating, by the electronic device (100), the at least one metadata tag related to the at least one data item based on the plurality of parameters.

[Claim 5] The method as claimed in claim 4, wherein plurality of parameters of image block comprises at least one of scene object block, expression block, face block, and activity block,
wherein plurality of parameters of text block comprises at least one of a keyword block, a language identification block, a classification block, a text summary block, and an electronic device (100) content aggregator block, and
wherein plurality of parameters of audio block comprises at least one of audio summary and language identification.

[Claim 6] The method as claimed in claim 1, wherein the electronic device (100) locally generates the at least one metadata tag without interacting with any network devices.

[Claim 7] The method as claimed in claim 1, wherein the at least one metadata tag is customizable by the user.

[Claim 8] The method of claim 1, wherein the at least one data item comprises an image file, a video file, an audio file, and a text document.

[Claim 9] An electronic device (100) for retrieving intelligent information, comprising::
a memory (130); and
a processor (120), operationally coupled to the memory (130) configured to:
receive an input from a user;
identify at least one data item to generate at least one metadata tag;
automatically generate the at least one metadata tag related to the at least one data item based on a plurality of parameters;
provide at least one priority to the at least one metadata tag; and
store the at least one metadata tag at the electronic device (100).

[Claim 10] The electronic device (100) as claimed in claim 9, further comprises:
receiving, by the electronic device (100), at least one candidate metadata tag;
comparing, by the electronic device (100), the at least one candidate metadata tag with the at least one stored metadata tag;
retrieving, by the electronic device (100), at least one data item corresponding to the at least one candidate metadata tag in response to determining a match between the at least one candidate metadata tag with the at least one stored metadata tag; and
performing, by the electronic device (100), at least one action using the at least one retrieved data item.

[Claim 11] The electronic device (100) as claimed in claim 10, wherein the at least one data item is retrieved based on the priority associated with the at least one candidate metadata tag.

[Claim 12] The electronic device (100) as claimed in claim 9, wherein automatically generating, by the electronic device (100), the at least one metadata tag related to the at least one data item based on a plurality of parameters comprises:

identifying, by the electronic device (100), at least one of an image block, a text block, and an audio block available in the data item;

determining, by the electronic device (100), the plurality of parameters associated with the at least one of the image block, text block, and audio block; and

generating, by the electronic device (100), the at least one metadata tag related to the at least one data item based on the plurality of parameters.

[Claim 13] The electronic device (100) as claimed in claim 12, wherein plurality of parameters of image block comprises at least one of scene object block, expression block, face block, and activity block,

wherein plurality of parameters of text block comprises at least one of a keyword block, a language identification block, a classification block, a text summary block, and an electronic device (100) content aggregator block, and

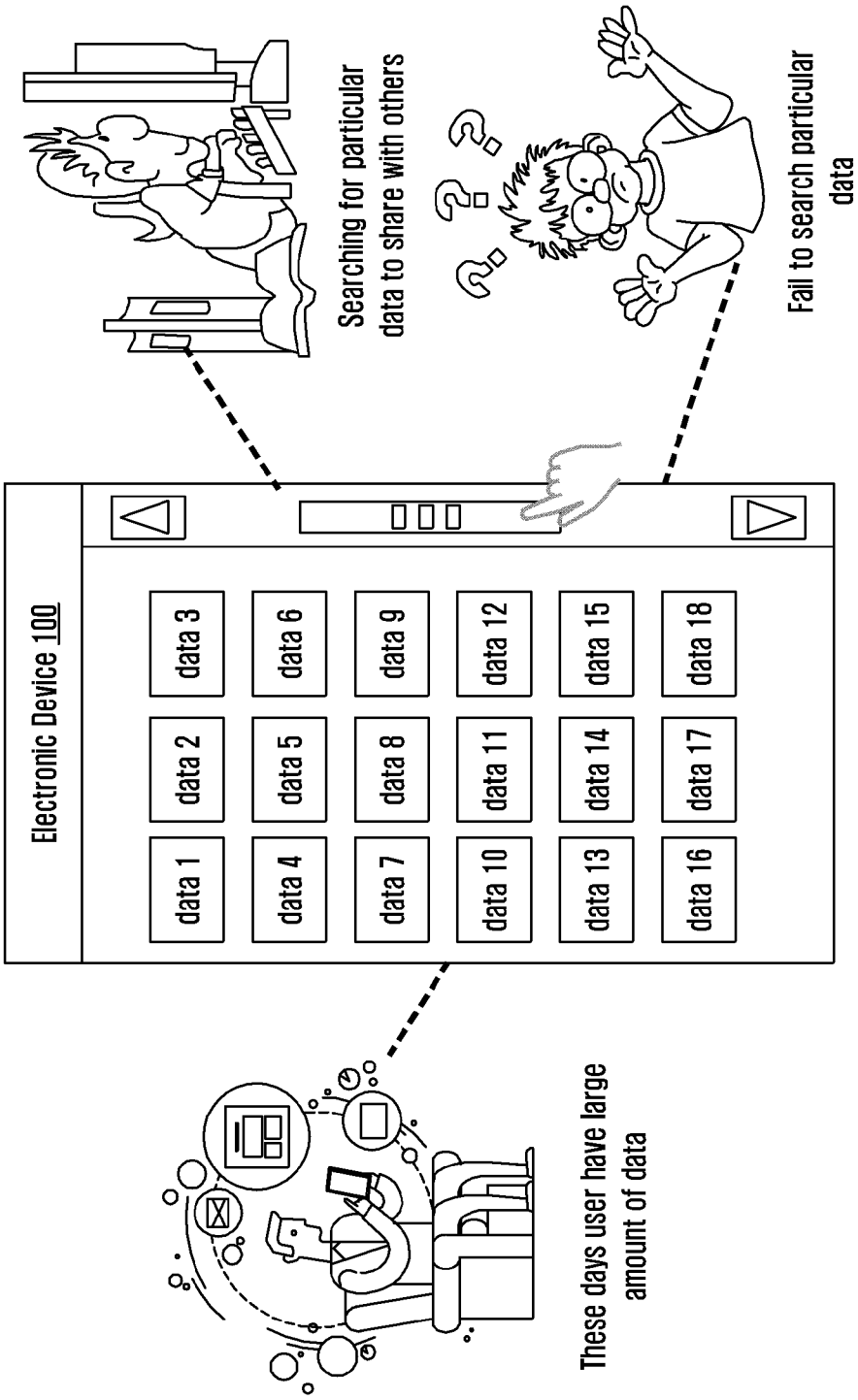
wherein plurality of parameters of audio block comprises at least one of audio summary and language identification.

[Claim 14] The electronic device (100) as claimed in claim 9, wherein the electronic device (100) locally generates the at least one metadata tag without interacting with any network devices.

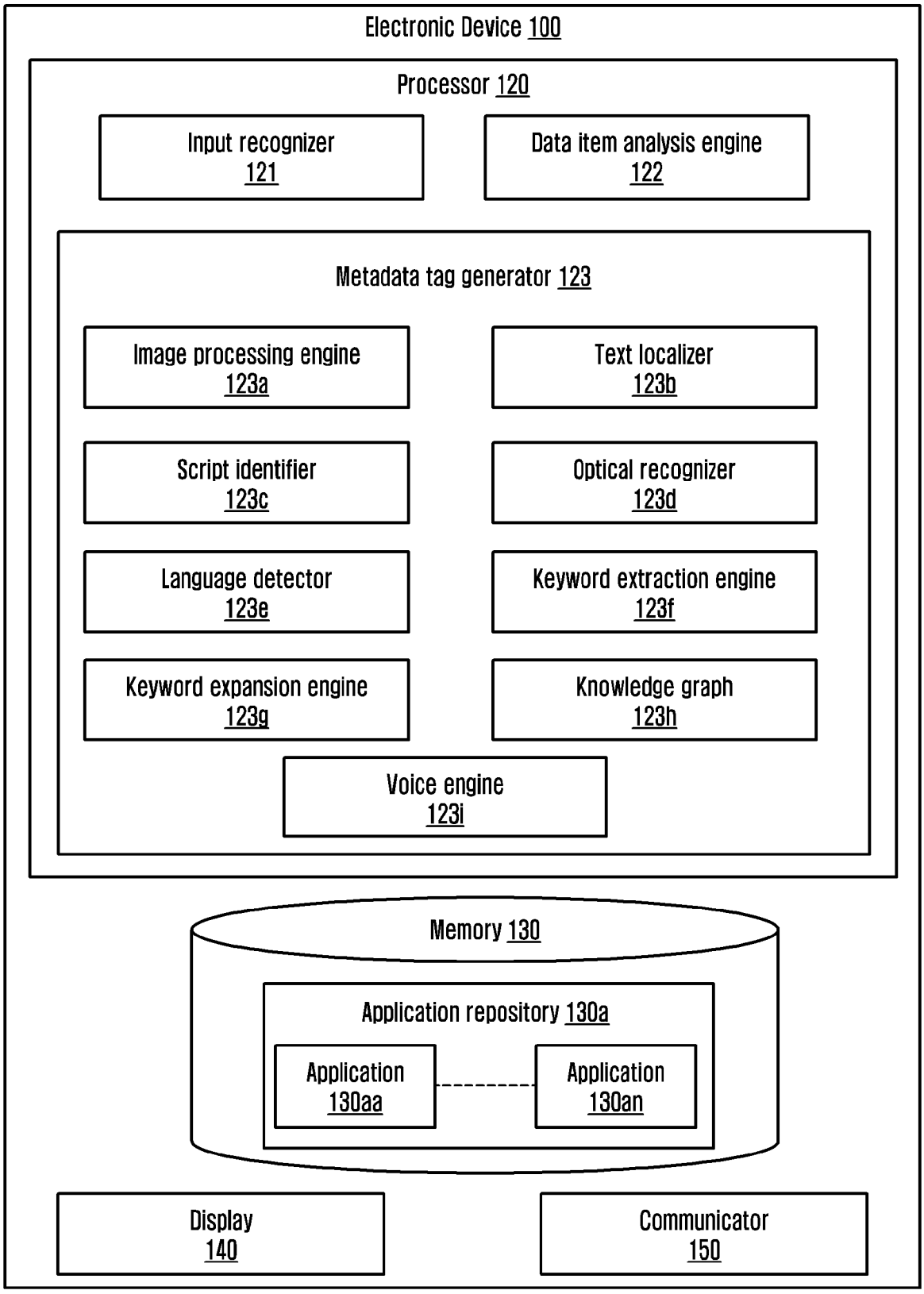
[Claim 15] The electronic device (100) as claimed in claim 9, wherein the at least one metadata tag is customizable by the user, and

wherein the at least one data item comprises an image file, a video file, an audio file, and a text document.

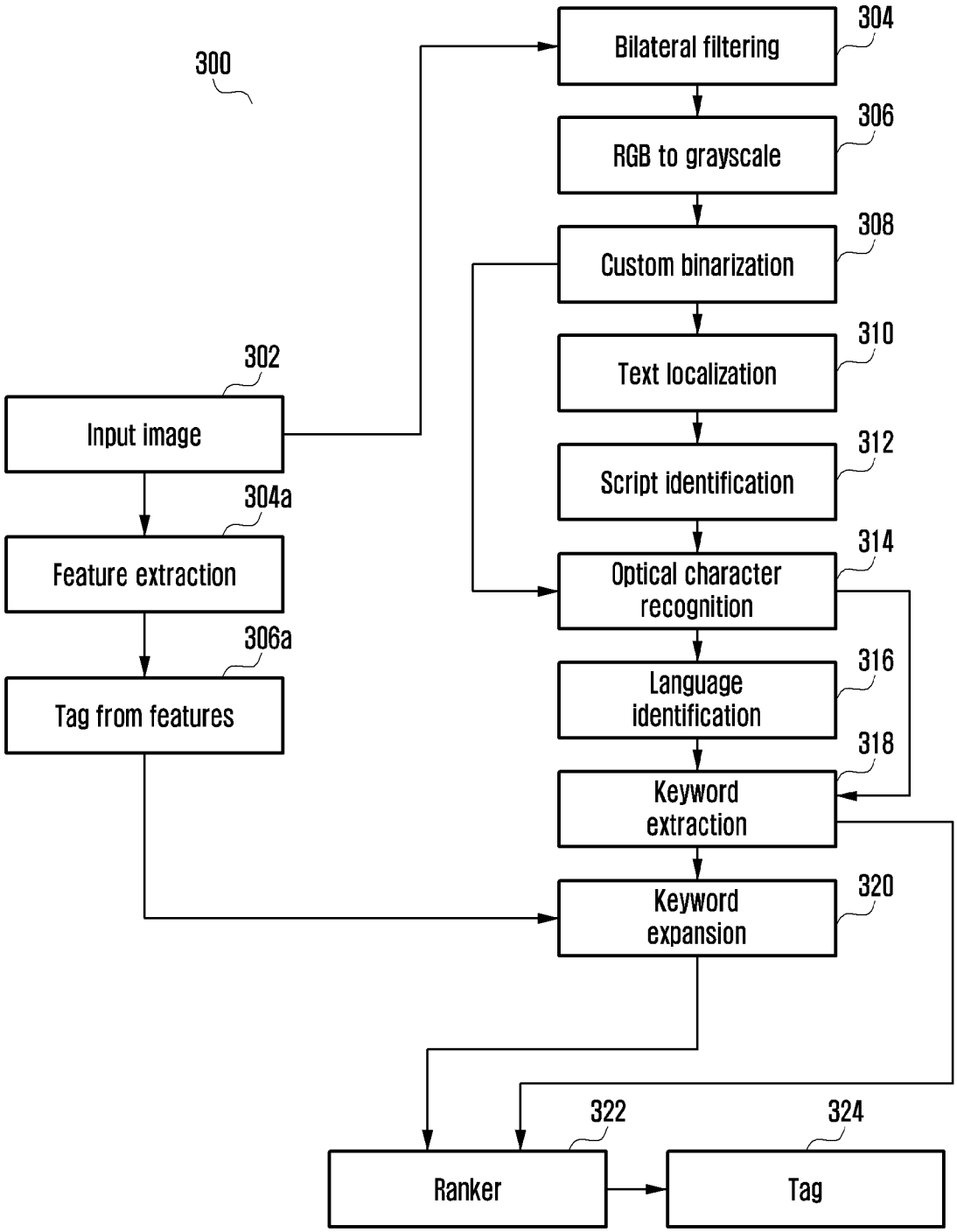
[Fig. 1]


Searching for particular data to share with others
Fail to search particular data
Electronic Device 100
data 1
data 2
data 3
data 4
data 5
data 6
data 7
data 8
data 9
data 10
data 11
data 12
data 13
data 14
data 15
data 16
data 17
data 18
These days user have large amount of data

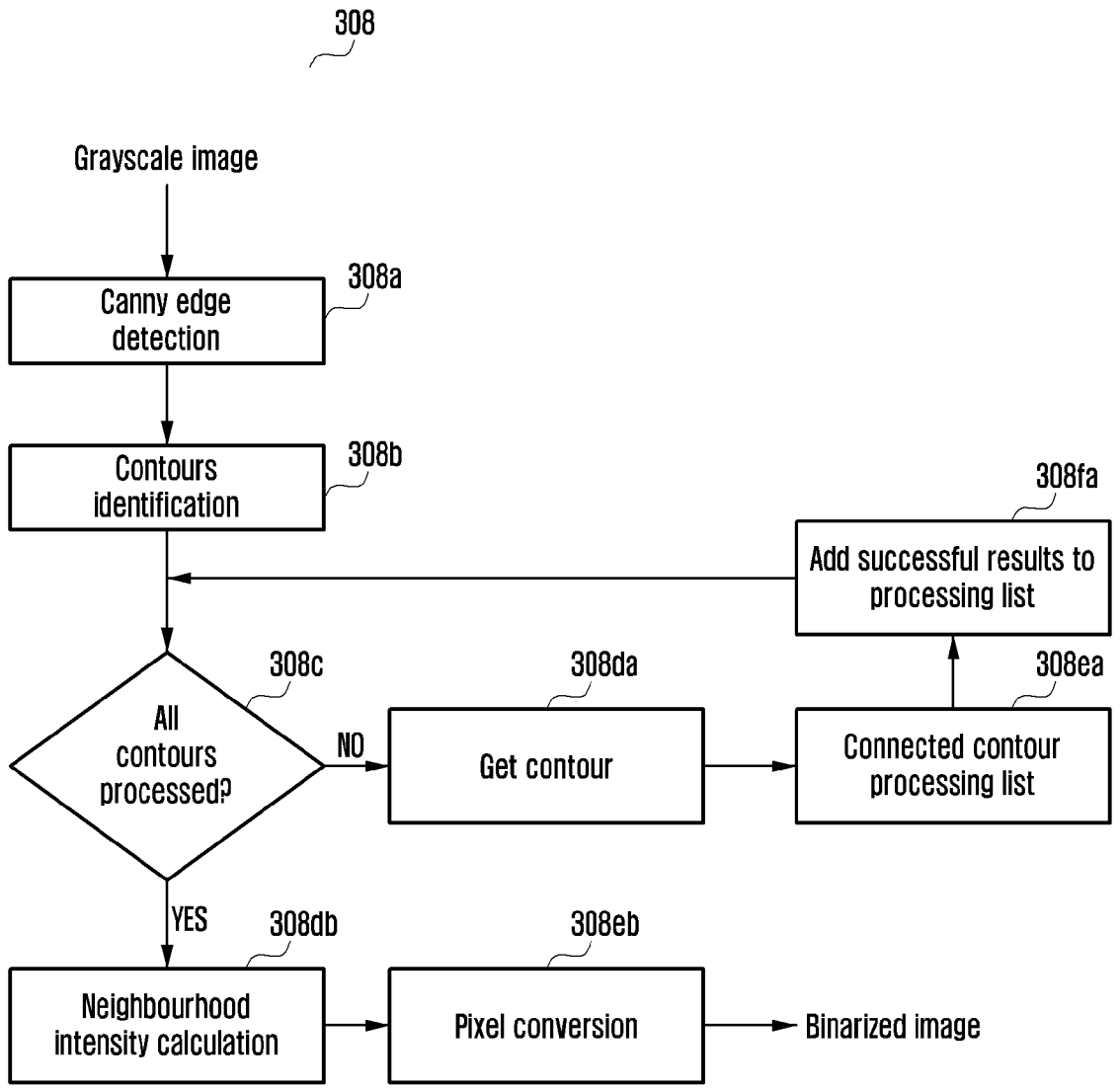
[Fig. 2]


Electronic Device 100
Processor 120
Input recognizer 121
Data item analysis engine 122
Metadata tag generator 123
Image processing engine 123a
Text localizer 123b
Script identifier 123c
Optical recognizer 123d
Language detector 123e
Keyword extraction engine 123f
Keyword expansion engine 123g
Knowledge graph 123h
Voice engine 123i
Memory 130
Application repository 130a
Application 130aa
Application 130an
Display 140
Communicator 150

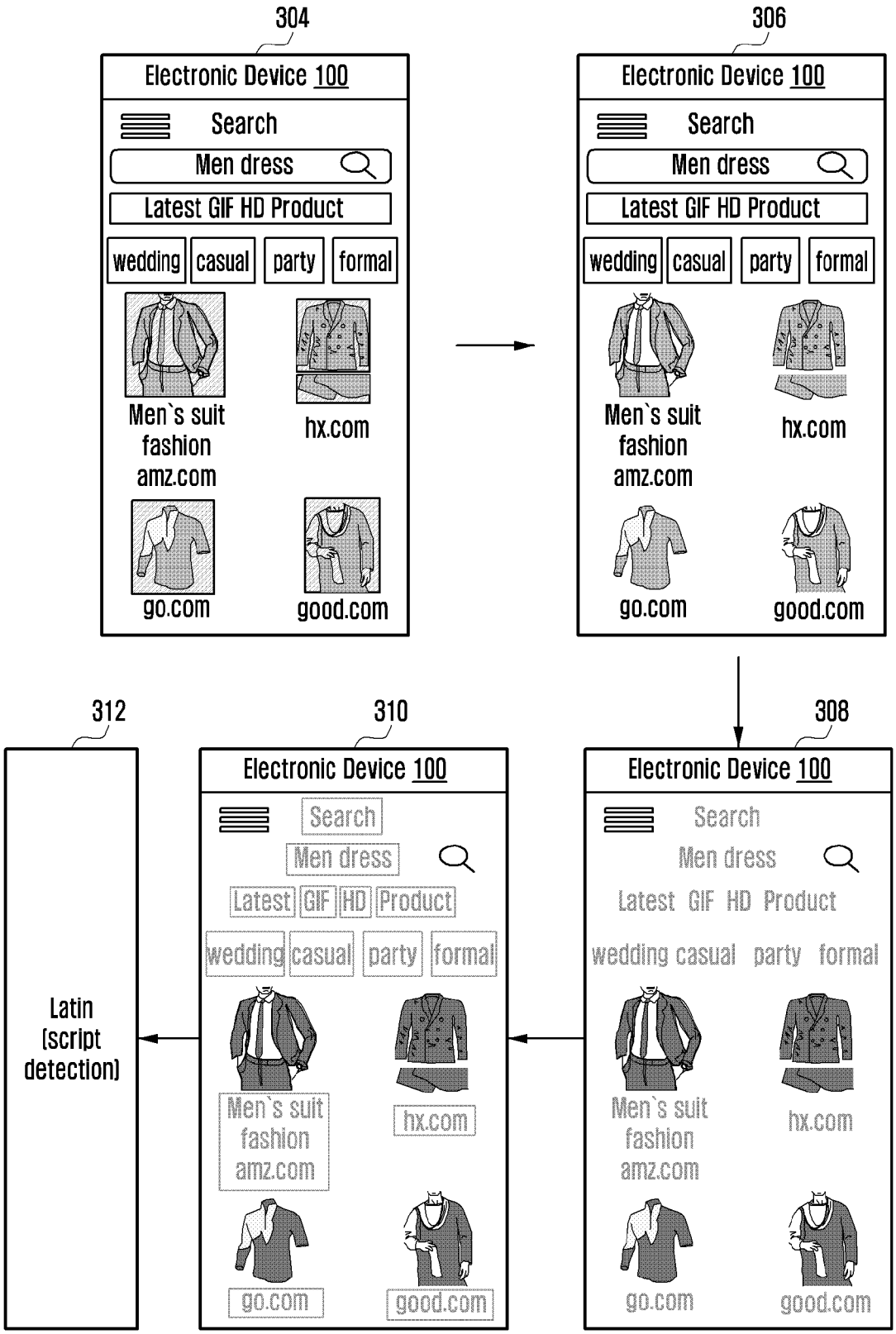
[Fig. 3A]


300
Bilateral filtering
304
RGB to grayscale
306
Custom binarization
308
Text localization
310
Script identification
312
Optical character recognition
314
Language identification
316
Keyword extraction
318
Keyword expansion
320
302
Input image
304a
Feature extraction
306a
Tag from features
322
Ranker
324
Tag

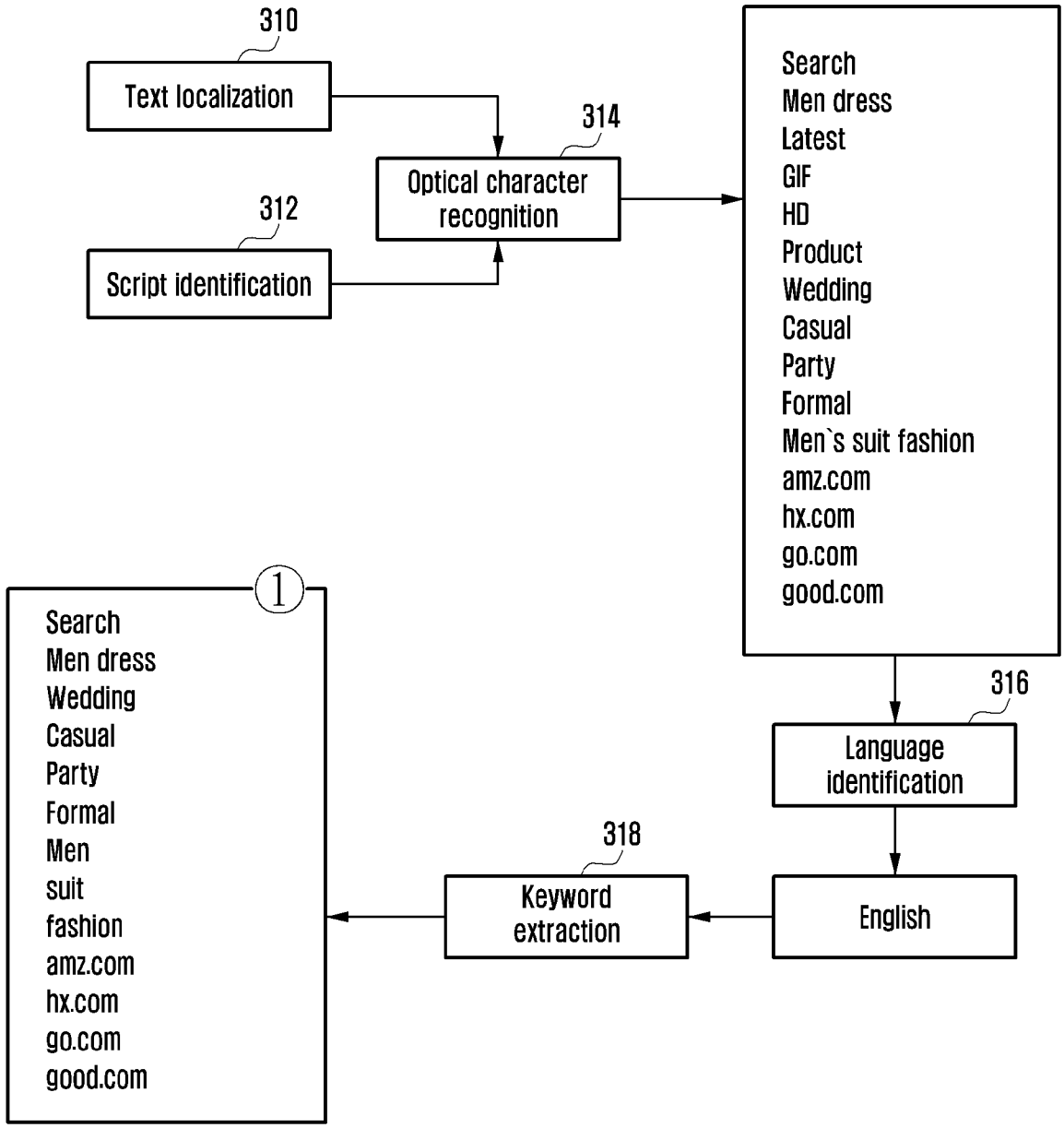
[Fig. 3B]


308
Grayscale image
Canny edge detection
308a
Contours identification
308b
308fa
Add successful results to processing list
All contours processed?
308c
NO
308da
Get contour
308ea
Connected contour processing list
YES
308db
Neighbourhood intensity calculation
308eb
Pixel conversion
Binarized image

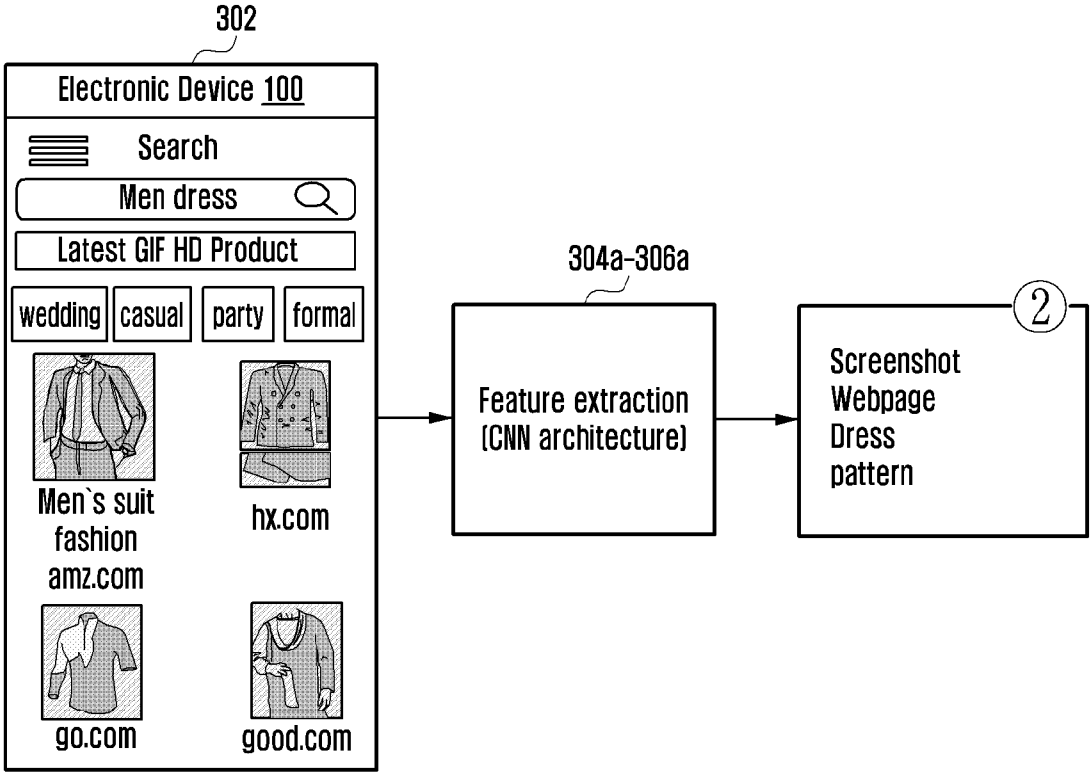
[Fig. 4A]


304
Electronic Device 100
Search
Men dress
Latest GIF HD Product
wedding
casual
party
formal
Men`s suit fashion amz.com
hx.com
go.com
good.com
306
Electronic Device 100
Search
Men dress
Latest GIF HD Product
wedding
casual
party
formal
Men`s suit fashion amz.com
hx.com
go.com
good.com
308
Electronic Device 100
Search
Men dress
Latest GIF HD Product
wedding casual party formal
Men`s suit fashion amz.com
hx.com
go.com
good.com
310
Electronic Device 100
Search
Men dress
Latest GIF HD Product
wedding
casual
party
formal
Men`s suit fashion amz.com
hx.com
go.com
good.com
312
Latin (script detection)

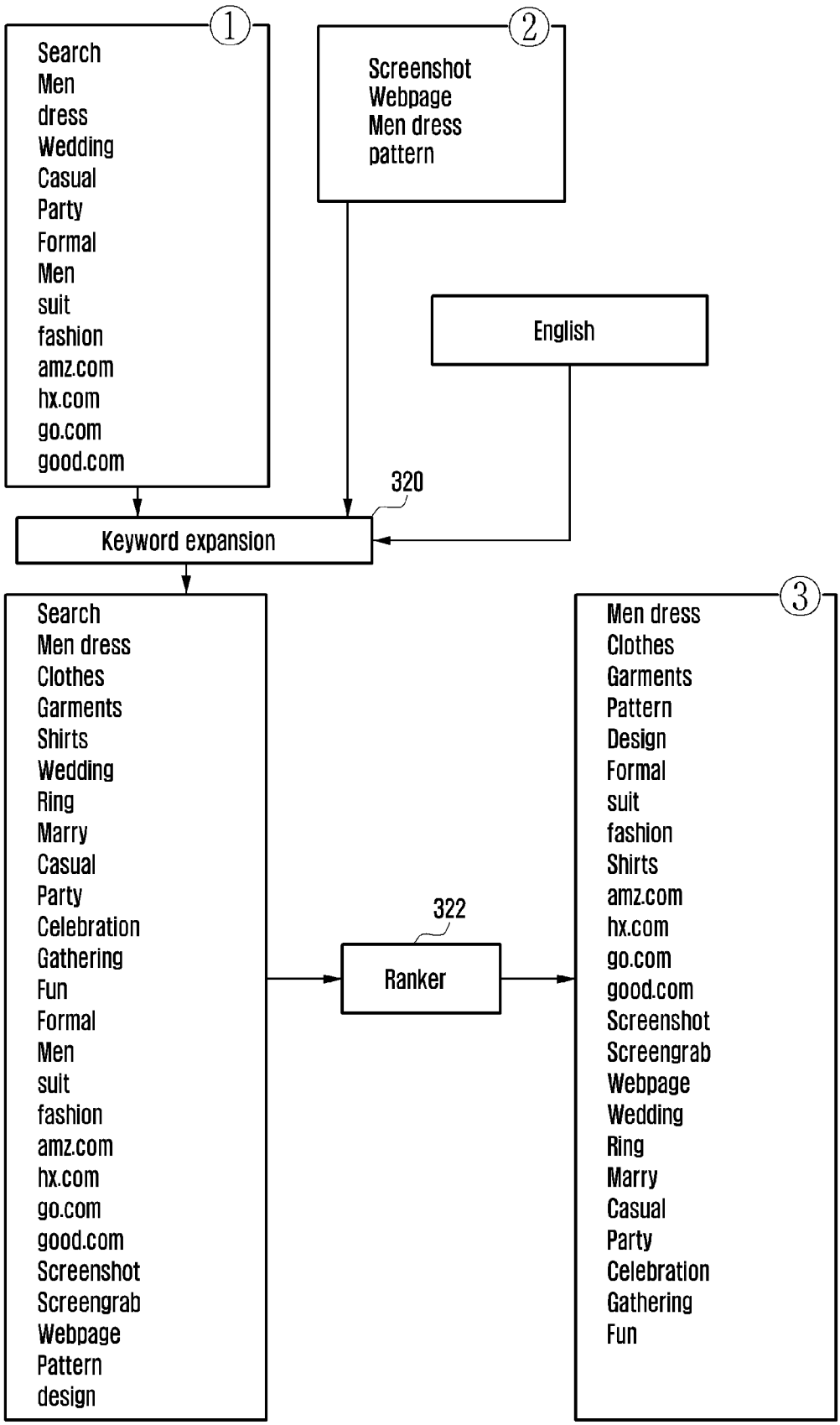
[Fig. 4B]


310
Text localization
312
Script identification
314
Optical character recognition
Search
Men dress
Latest
GIF
HD
Product
Wedding
Casual
Party
Formal
Men`s suit fashion
amz.com
hx.com
go.com
good.com
316
Language identification
English
318
Keyword extraction
①
Search
Men dress
Wedding
Casual
Party
Formal
Men
suit
fashion
amz.com
hx.com
go.com
good.com

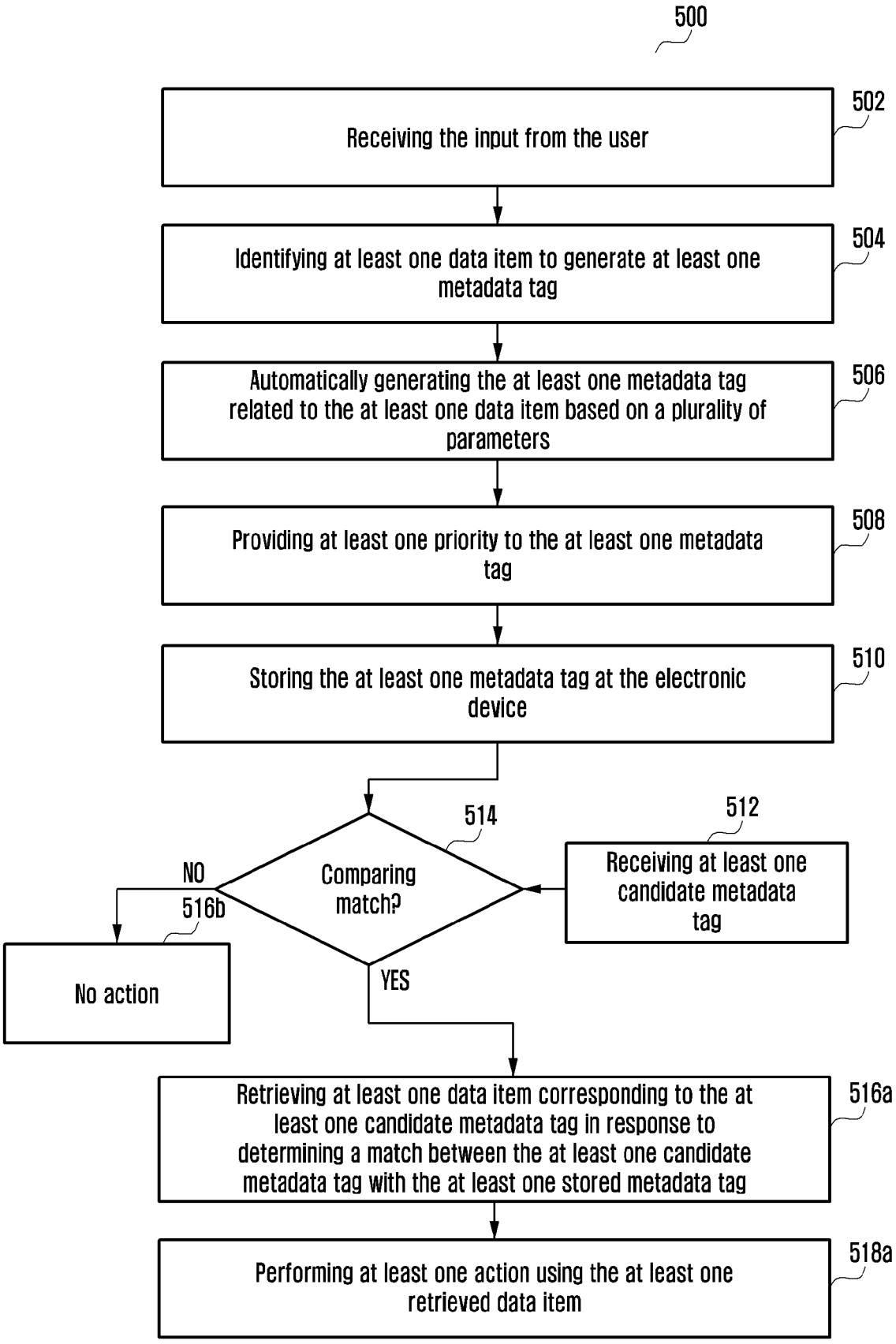
[Fig. 4C]


302
Electronic Device 100
Search
Men dress
Latest GIF HD Product
wedding
casual
party
formal
Men`s suit
fashion
amz.com
hx.com
go.com
good.com
304a-306a
Feature extraction
(CNN architecture)
2
Screenshot
Webpage
Dress
pattern

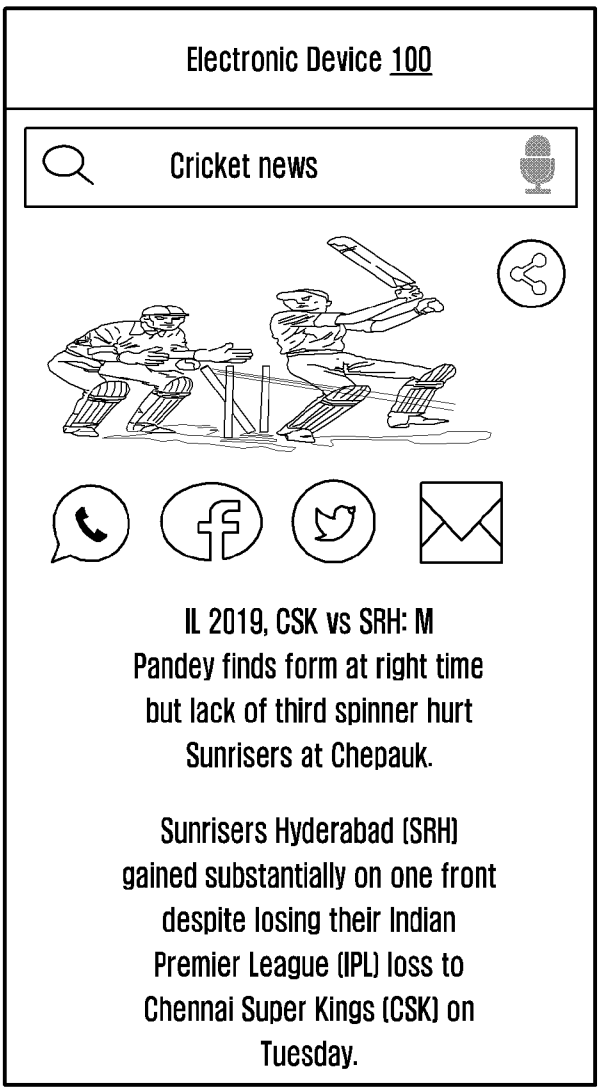
[Fig. 4D]


①
Search
Men
dress
Wedding
Casual
Party
Formal
Men
suit
fashion
amz.com
hx.com
go.com
good.com
②
Screenshot
Webpage
Men dress
pattern
English
320
Keyword expansion
Search
Men dress
Clothes
Garments
Shirts
Wedding
Ring
Marry
Casual
Party
Celebration
Gathering
Fun
Formal
Men
suit
fashion
amz.com
hx.com
go.com
good.com
Screenshot
Screengrab
Webpage
Pattern
design
322
Ranker
③
Men dress
Clothes
Garments
Pattern
Design
Formal
suit
fashion
Shirts
amz.com
hx.com
go.com
good.com
Screenshot
Screengrab
Webpage
Wedding
Ring
Marry
Casual
Party
Celebration
Gathering
Fun

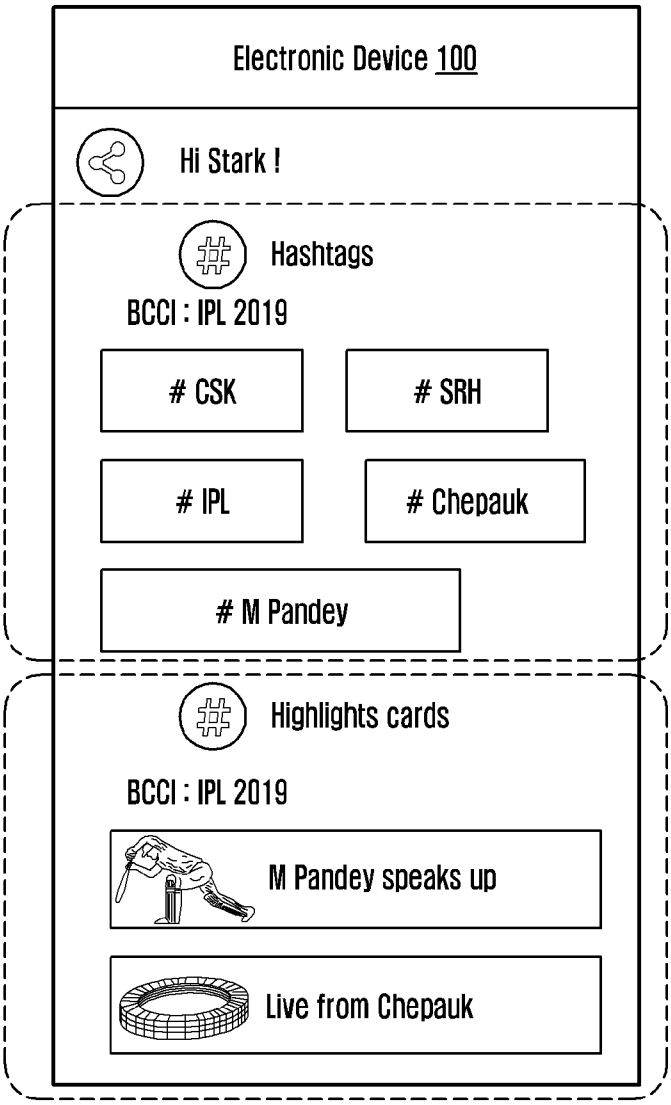
[Fig. 5]


500
Receiving the input from the user
502
Identifying at least one data item to generate at least one metadata tag
504
Automatically generating the at least one metadata tag related to the at least one data item based on a plurality of parameters
506
Providing at least one priority to the at least one metadata tag
508
Storing the at least one metadata tag at the electronic device
510
514
Comparing match?
512
Receiving at least one candidate metadata tag
NO
516b
No action
YES
Retrieving at least one data item corresponding to the at least one candidate metadata tag in response to determining a match between the at least one candidate metadata tag with the at least one stored metadata tag
516a
Performing at least one action using the at least one retrieved data item
518a

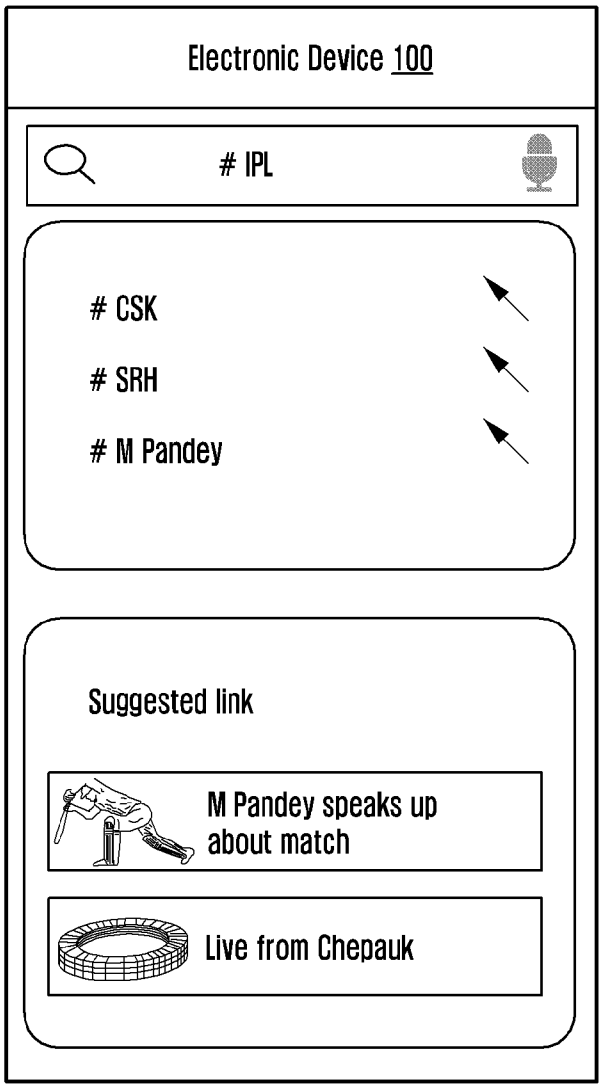
[Fig. 6A]


Electronic Device 100
Cricket news
IL 2019, CSK vs SRH: M
Pandey finds form at right time
but lack of third spinner hurt
Sunrisers at Chepauk.
Sunrisers Hyderabad (SRH)
gained substantially on one front
despite losing their Indian
Premier League (IPL) loss to
Chennai Super Kings (CSK) on
Tuesday.

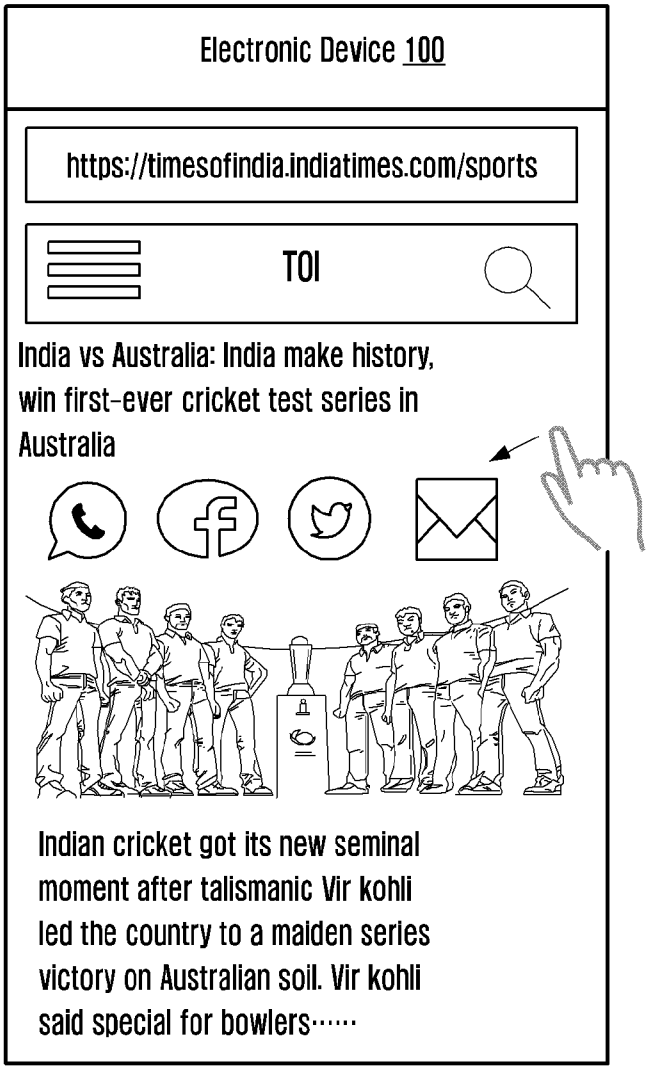
[Fig. 6B]


Electronic Device 100
Hi Stark !
Hashtags
BCCI : IPL 2019
CSK
SRH
IPL
Chepauk
M Pandey
Highlights cards
BCCI : IPL 2019
M Pandey speaks up
Live from Chepauk

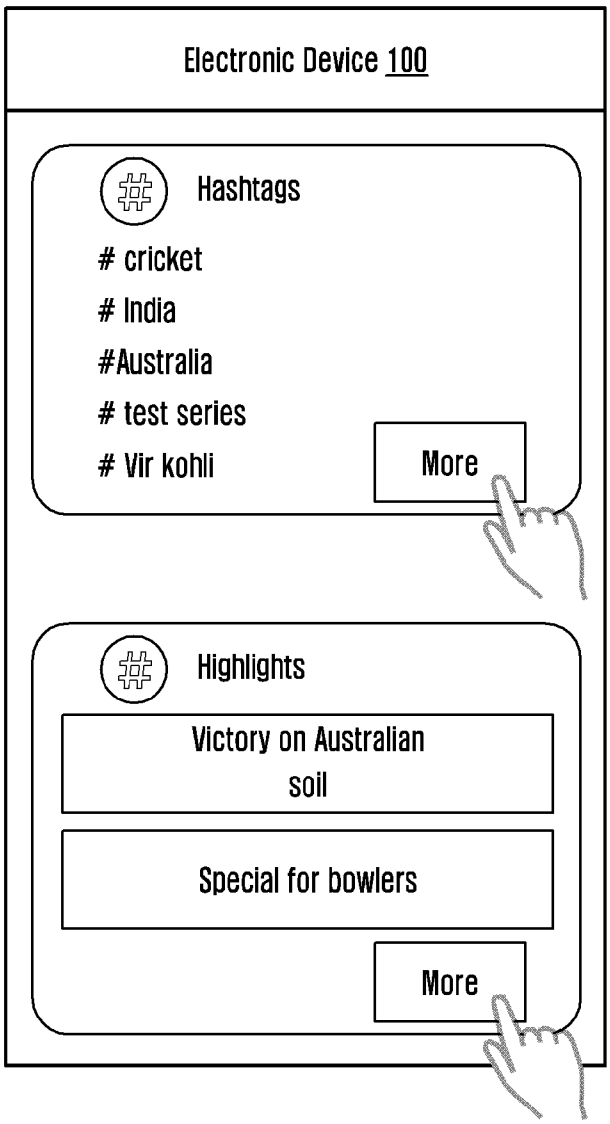
[Fig. 6C]


Electronic Device 100
IPL
CSK
SRH
M Pandey
Suggested link
M Pandey speaks up about match
Live from Chepauk

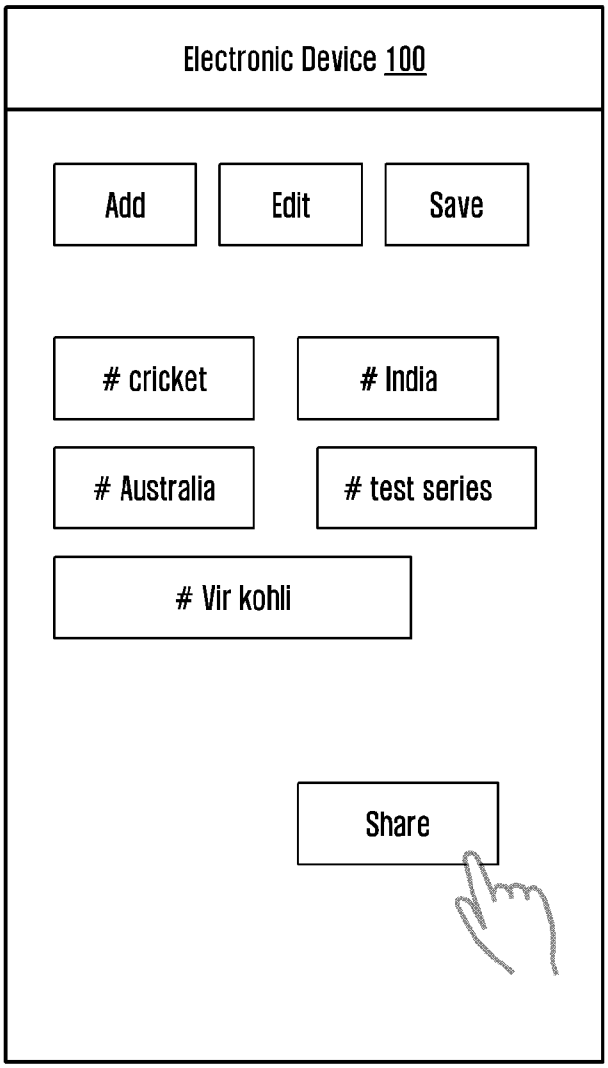
[Fig. 7A]


Electronic Device 100
https://timesofindia.indiatimes.com/sports
TOI
India vs Australia: India make history, win first-ever cricket test series in Australia
Indian cricket got its new seminal moment after talismanic Vir kohli led the country to a maiden series victory on Australian soil. Vir kohli said special for bowlers……

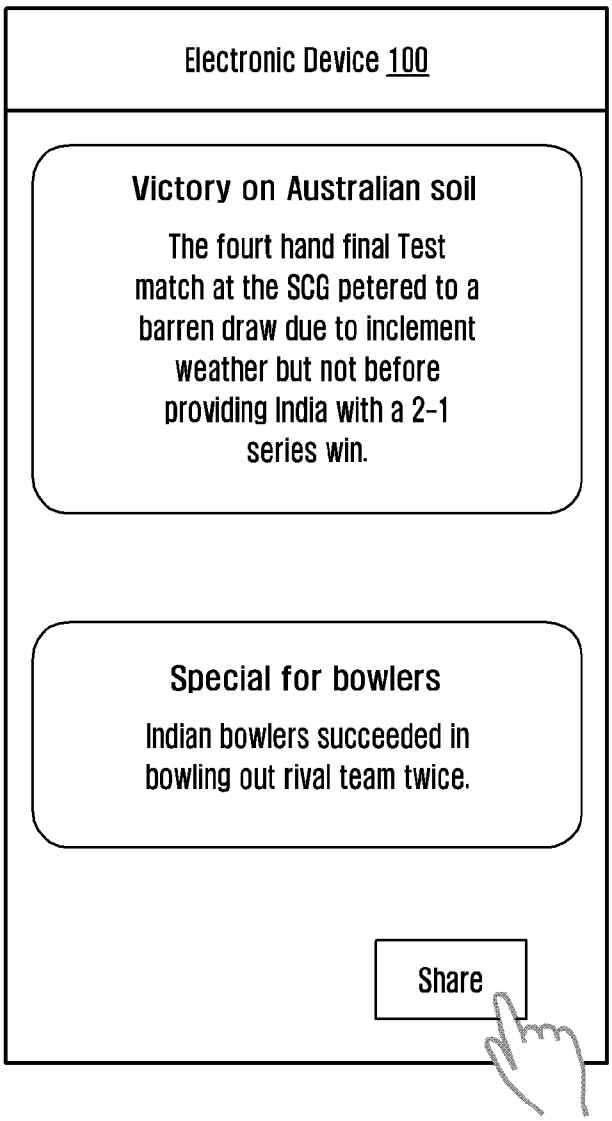
[Fig. 7B]


Electronic Device 100
Hashtags
cricket
India
#Australia
test series
Vir kohli
More
Highlights
Victory on Australian soil
Special for bowlers
More

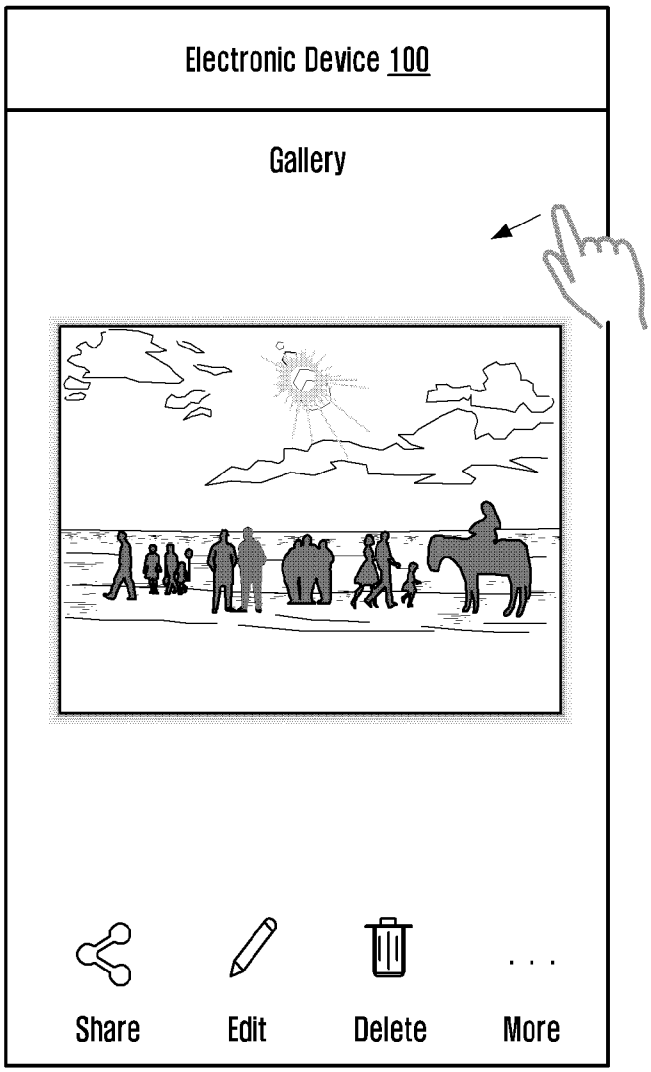
[Fig. 7C]


Electronic Device 100
Add
Edit
Save
cricket
India
Australia
test series
Vir kohli
Share

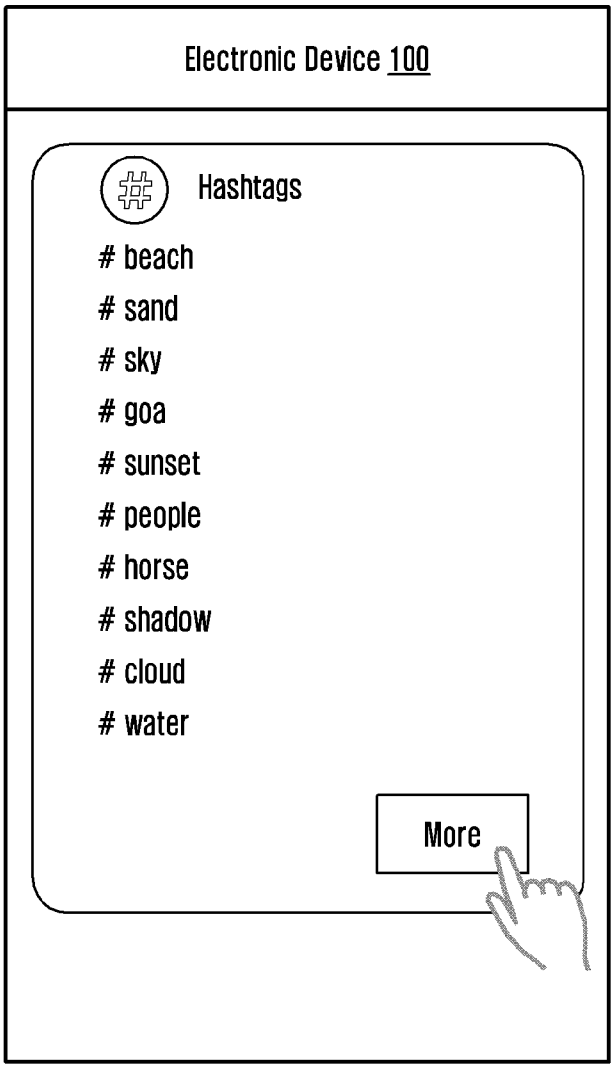
[Fig. 7D]


Electronic Device 100
Victory on Australian soil
The fourt hand final Test match at the SCG petered to a barren draw due to inclement weather but not before providing India with a 2-1 series win.
Special for bowlers
Indian bowlers succeeded in bowling out rival team twice.
Share

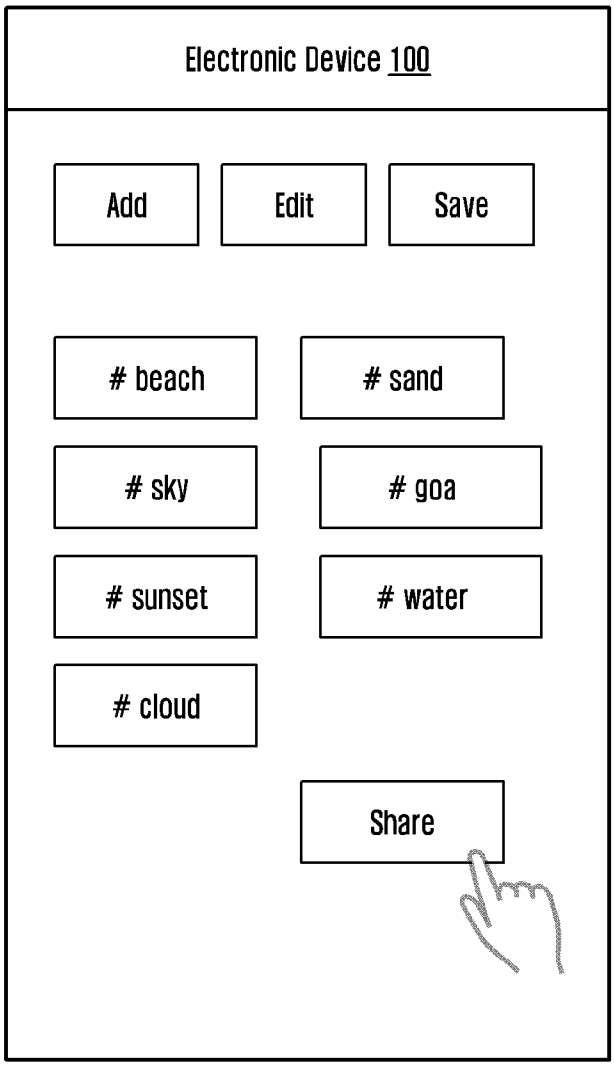
[Fig. 8A]



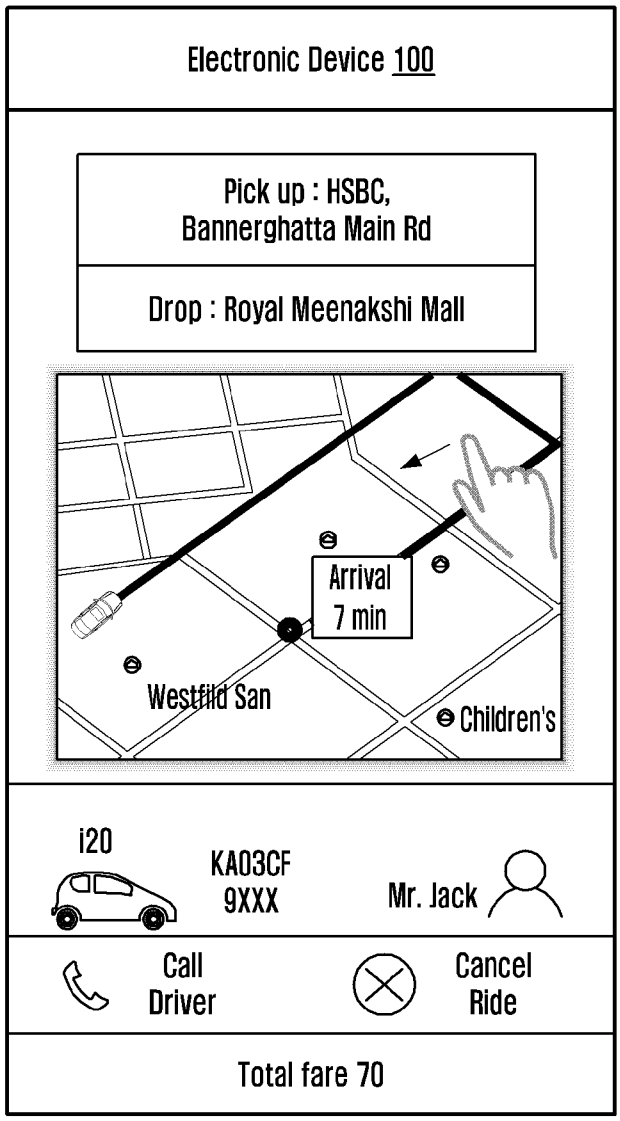
[Fig. 8B]


Electronic Device 100
Hashtags
beach
sand
sky
goa
sunset
people
horse
shadow
cloud
water
More

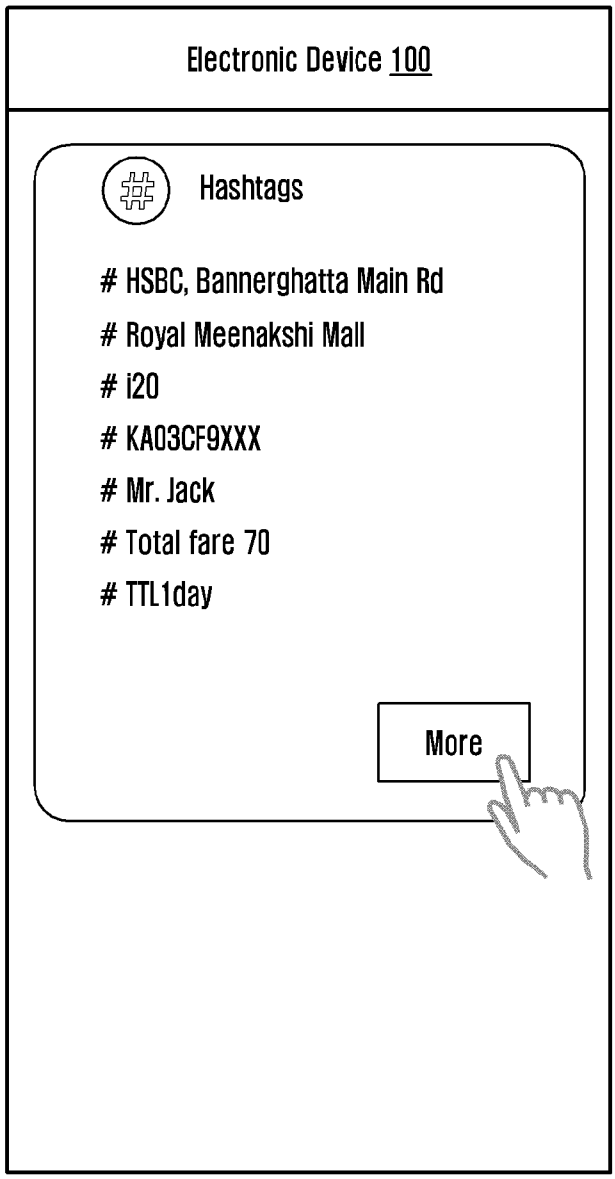
[Fig. 8C]


Electronic Device 100
Add
Edit
Save
beach
sand
sky
goa
sunset
water
cloud
Share

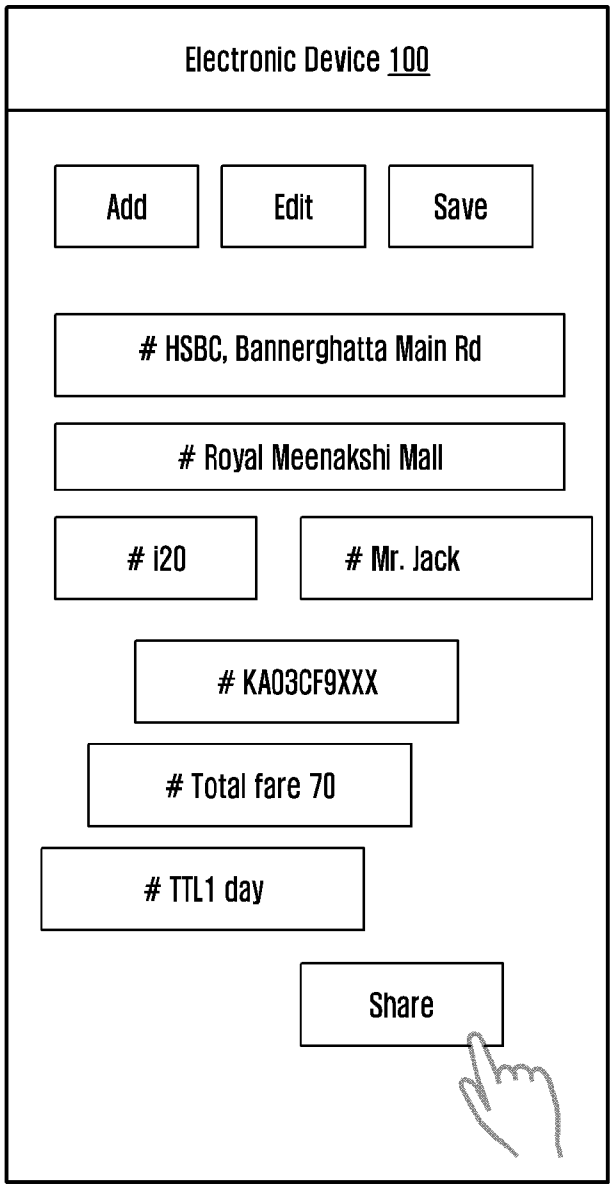
[Fig. 9A]


Electronic Device 100
Pick up : HSBC,
Bannerghatta Main Rd
Drop : Royal Meenakshi Mall
Arrival
7 min
Westfild San
Children's
i20
KA03CF
9XXX
Mr. Jack
Call
Driver
Cancel
Ride
Total fare 70

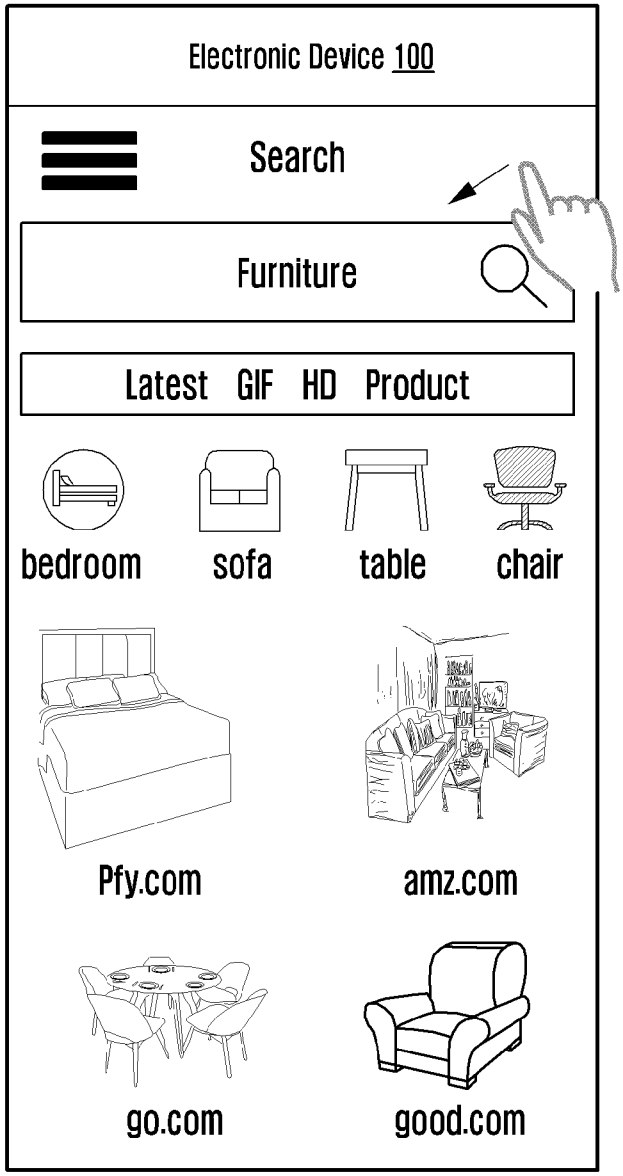
[Fig. 9B]


Electronic Device 100
Hashtags
HSBC, Bannerghatta Main Rd
Royal Meenakshi Mall
i20
KA03CF9XXX
Mr. Jack
Total fare 70
TTL1day
More

[Fig. 9C]


Electronic Device 100
Add
Edit
Save
HSBC, Bannerghatta Main Rd
Royal Meenakshi Mall
i20
Mr. Jack
KA03CF9XXX
Total fare 70
TTL1 day
Share

[Fig. 10A]

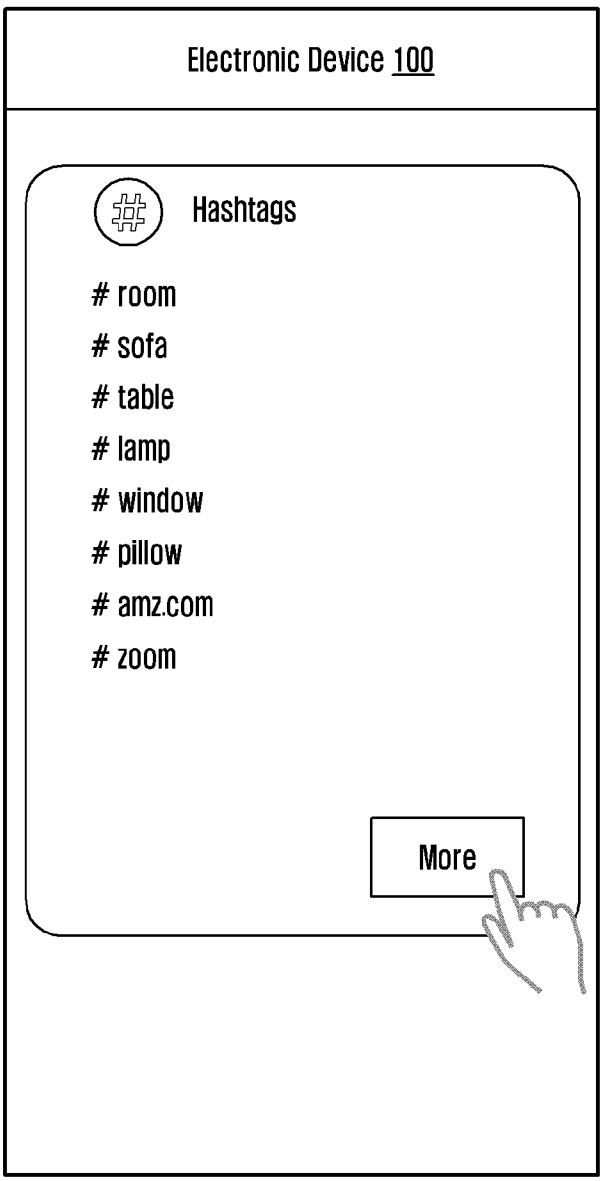

Electronic Device 100
Search
Furniture
Latest GIF HD Product
bedroom
sofa
table
chair
Pfy.com
amz.com
go.com
good.com

[Fig. 10B]

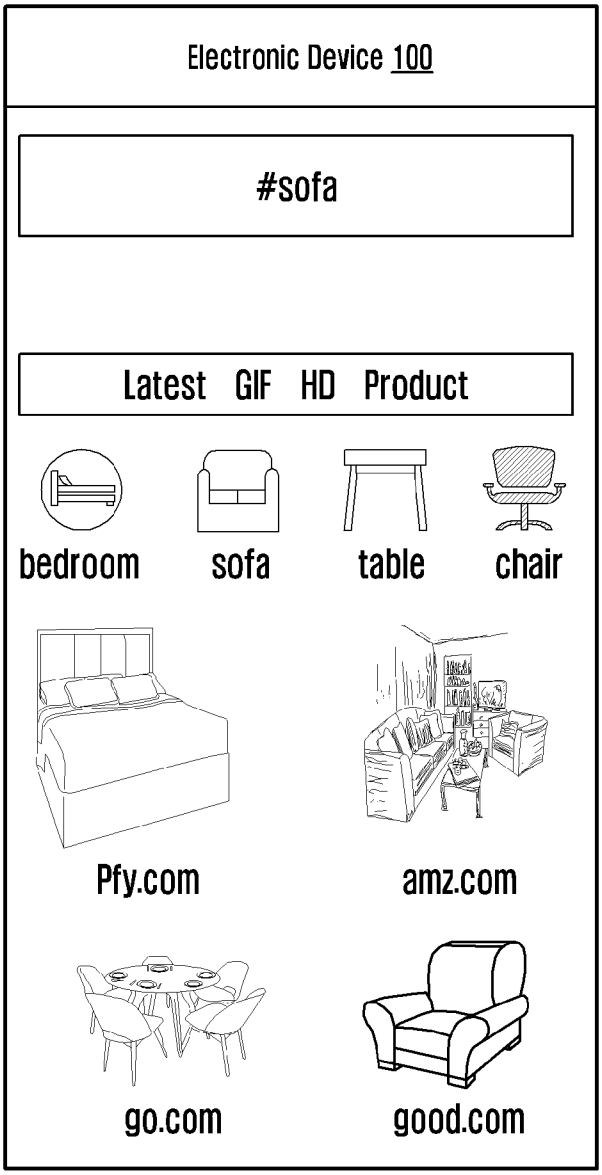

Electronic Device 100
Hashtags
furniture
room
sofa
table
chair
pfy.com
amz.com
go.com
good.com
More

[Fig. 10C]

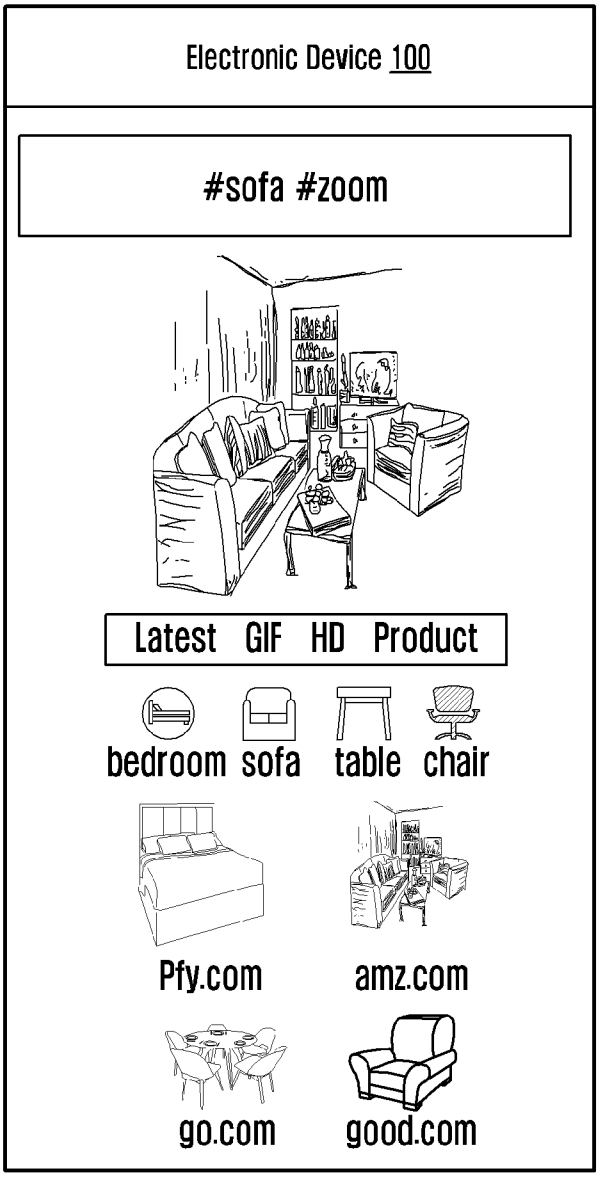
[Fig. 10D]


Electronic Device 100
Hashtags
room
sofa
table
lamp
window
pillow
amz.com
zoom
More

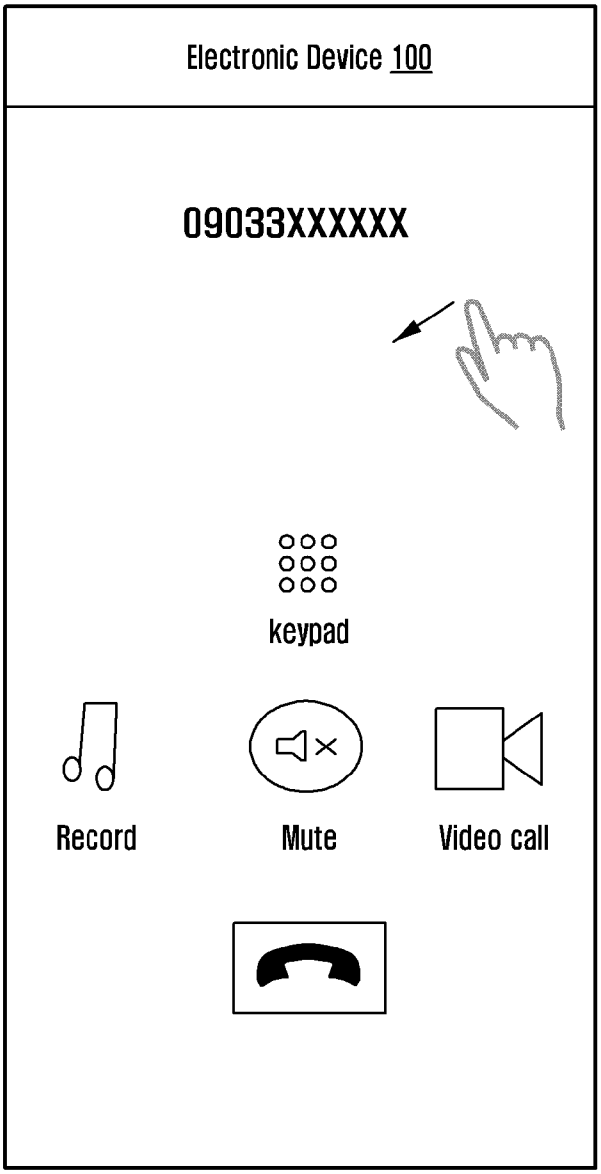
[Fig. 10E]


Electronic Device 100
#sofa
Latest GIF HD Product
bedroom
sofa
table
chair
Pfy.com
amz.com
go.com
good.com

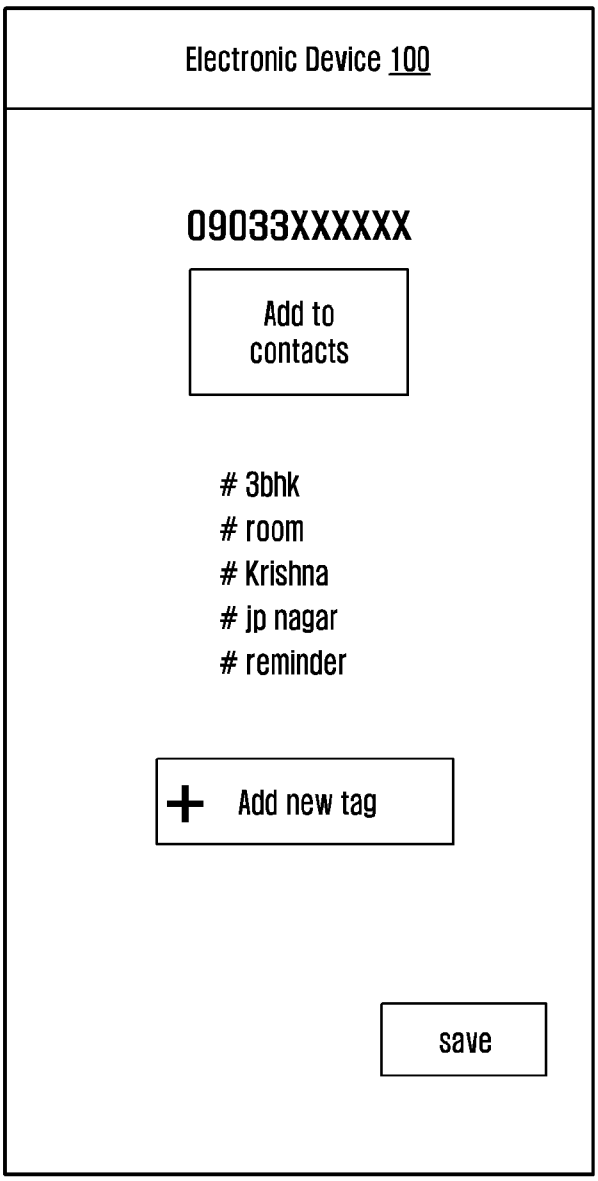
[Fig. 10F]


Electronic Device 100
#sofa #zoom
Latest GIF HD Product
bedroom
sofa
table
chair
Pfy.com
amz.com
go.com
good.com

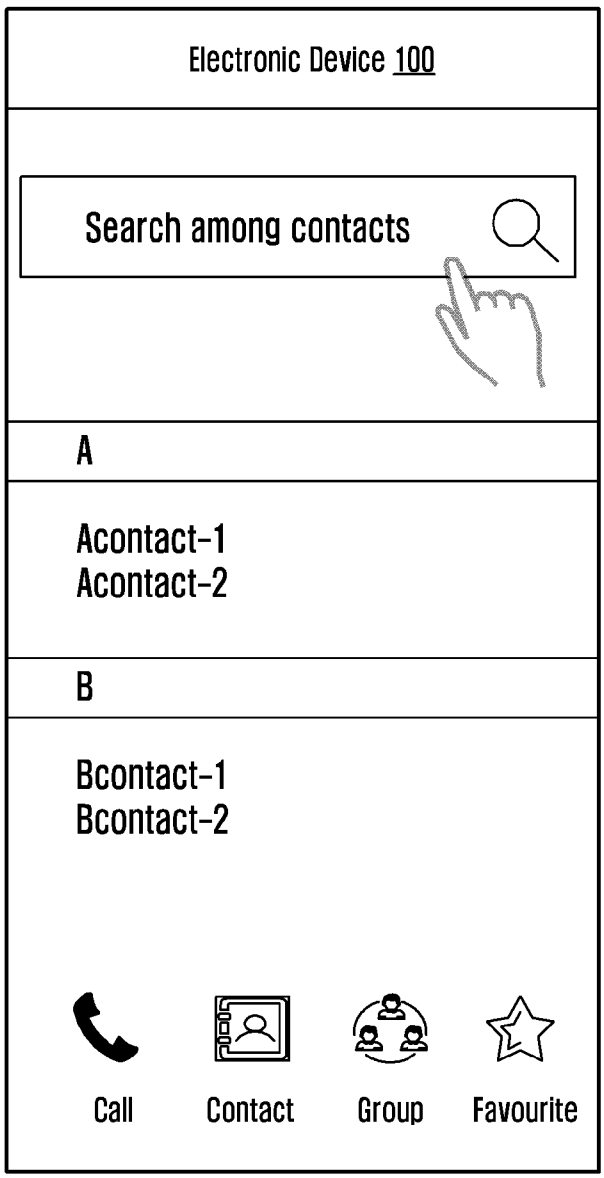
[Fig. 11A]


Electronic Device 100
09033XXXXXX
keypad
Record
Mute
Video call

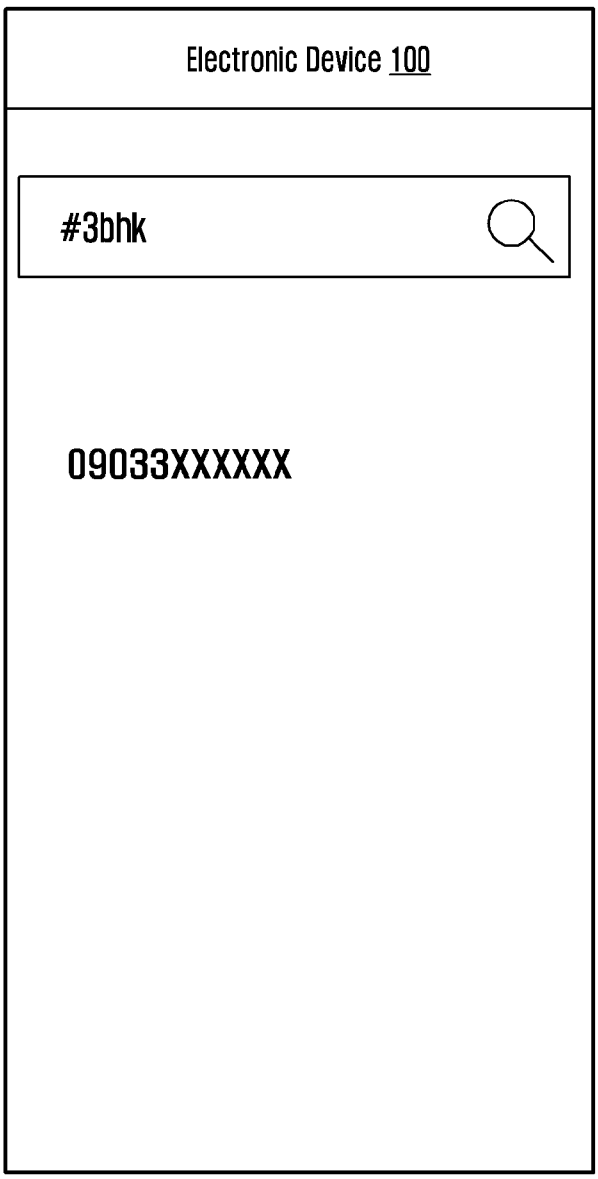
[Fig. 11B]


Electronic Device 100
09033XXXXXX
Add to contacts
3bhk
room
Krishna
jp nagar
reminder
+ Add new tag
save

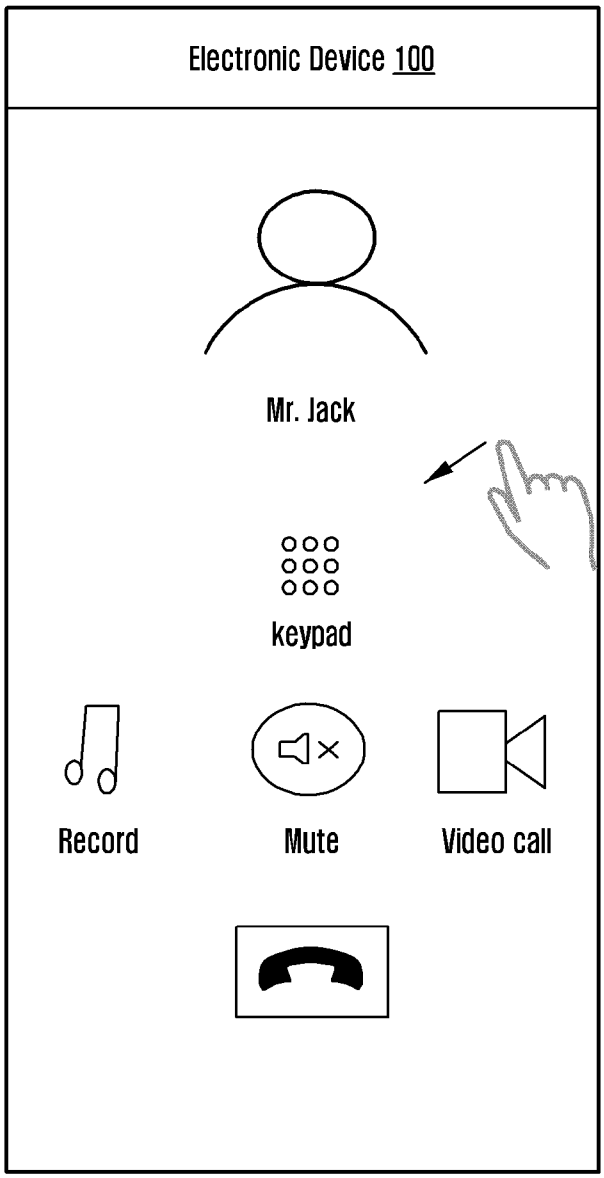
[Fig. 11C]


Electronic Device 100
Search among contacts
A
Acontact-1
Acontact-2
B
Bcontact-1
Bcontact-2
Call
Contact
Group
Favourite

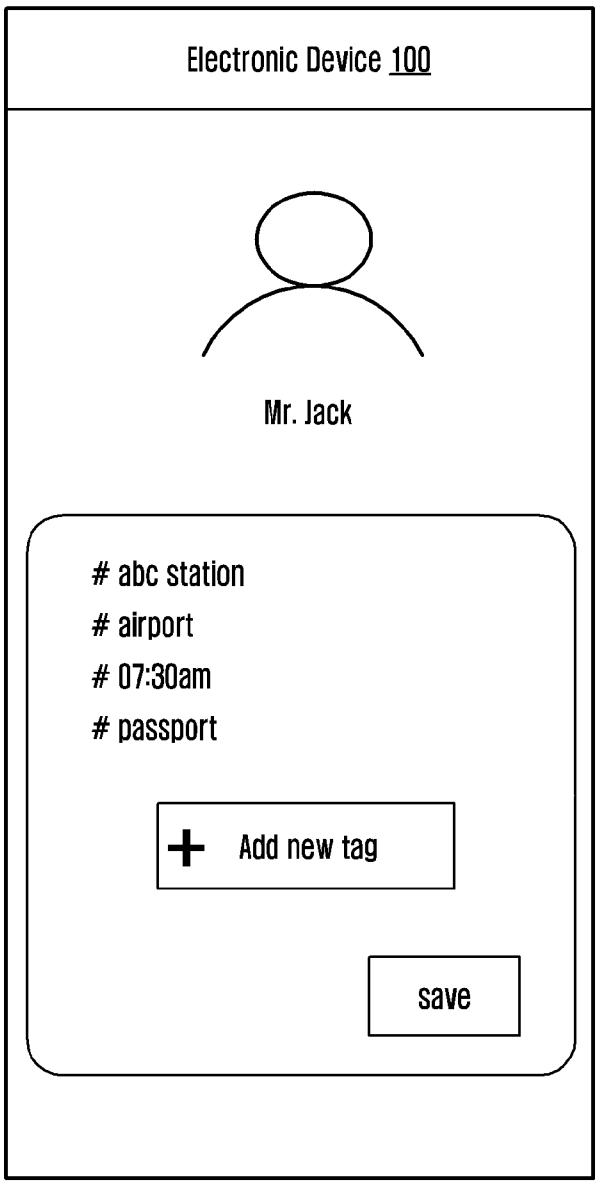
[Fig. 11D]



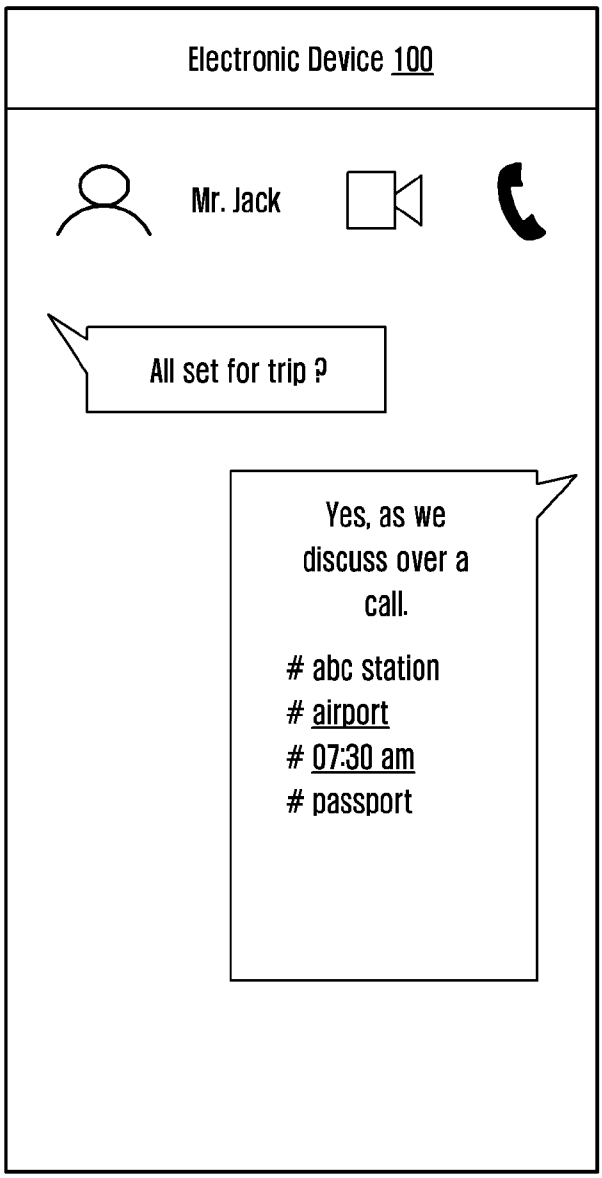
[Fig. 12A]


Electronic Device 100
Mr. Jack
keypad
Record
Mute
Video call

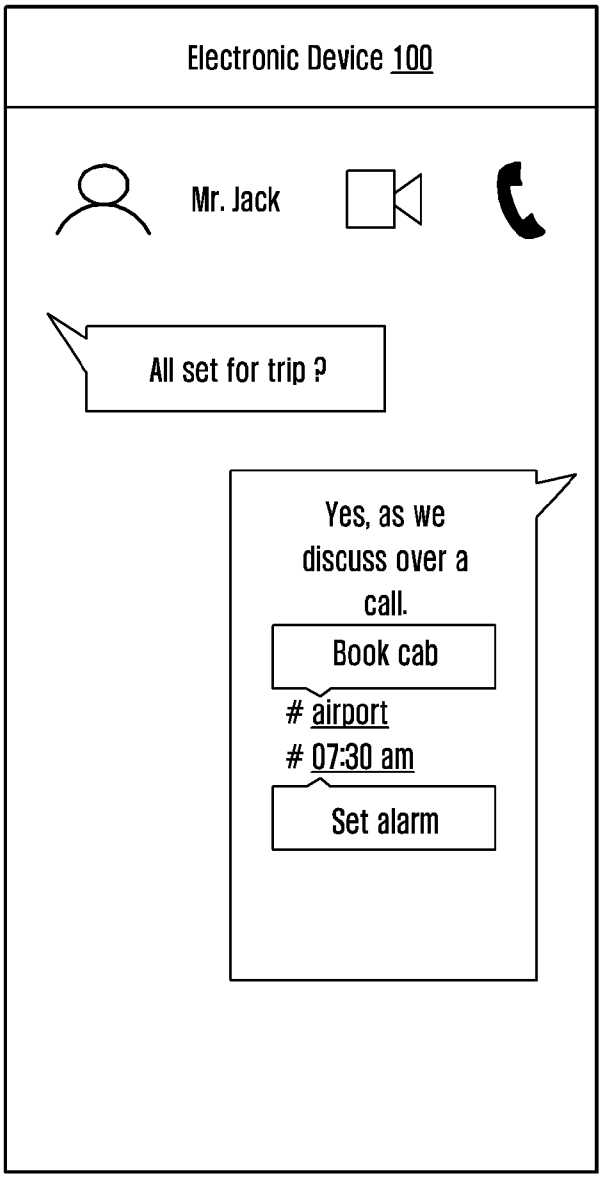
[Fig. 12B]


Electronic Device 100
Mr. Jack
abc station
airport
07:30am
passport
Add new tag
save

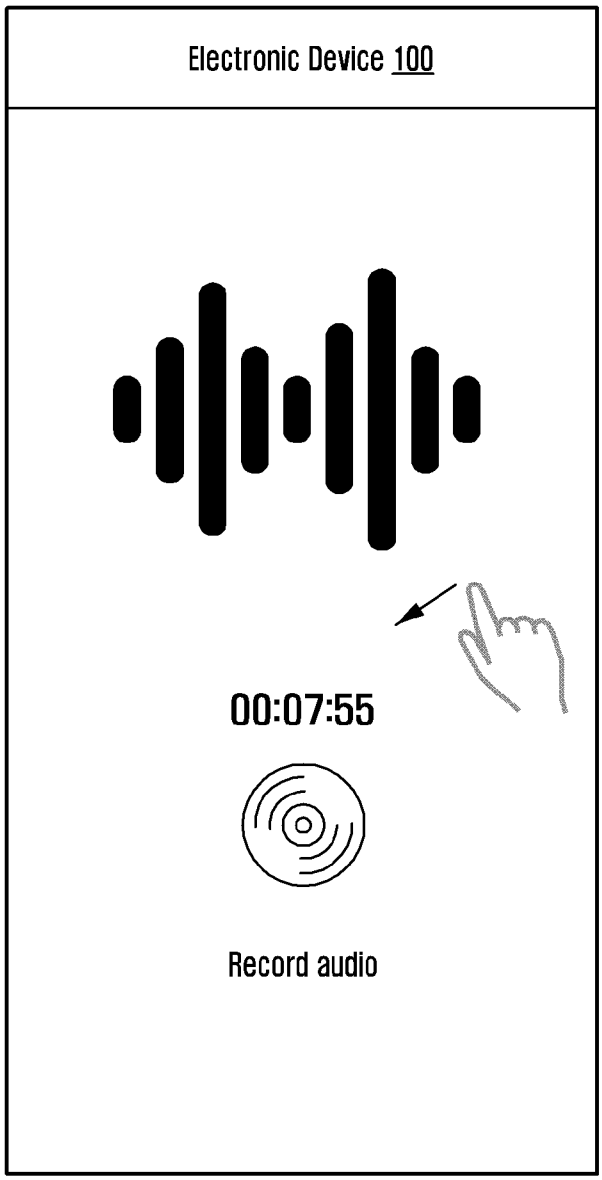
[Fig. 12C]


Electronic Device 100
Mr. Jack
All set for trip ?
Yes, as we discuss over a call.
abc station
airport
07:30 am
passport

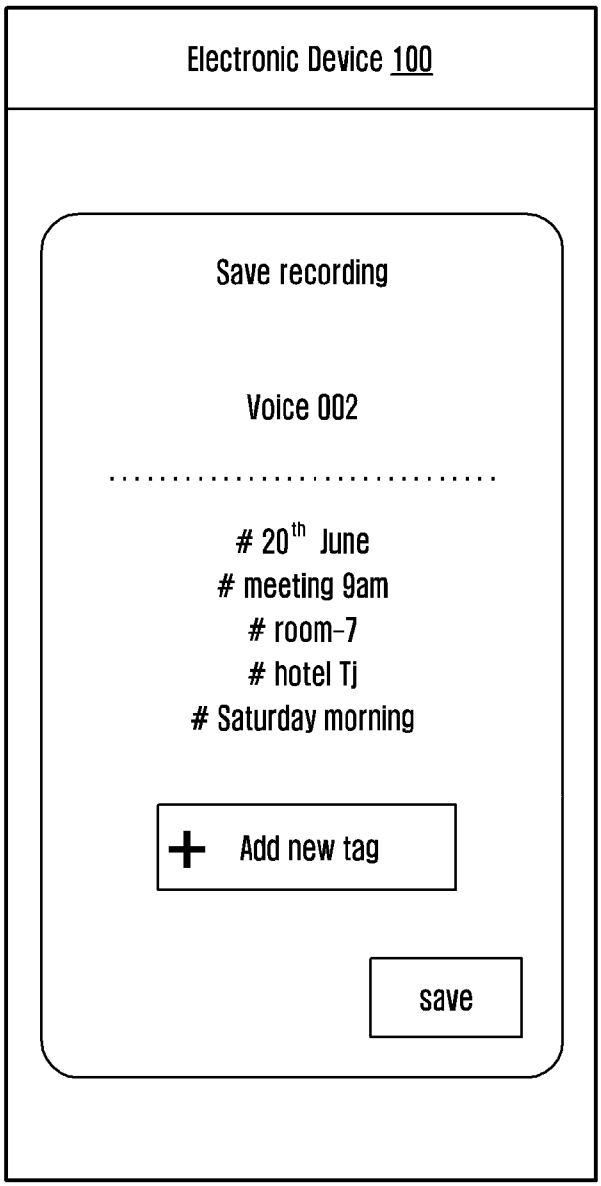
[Fig. 12D]


Electronic Device 100
Mr. Jack
All set for trip ?
Yes, as we discuss over a call.
Book cab
airport
07:30 am
Set alarm

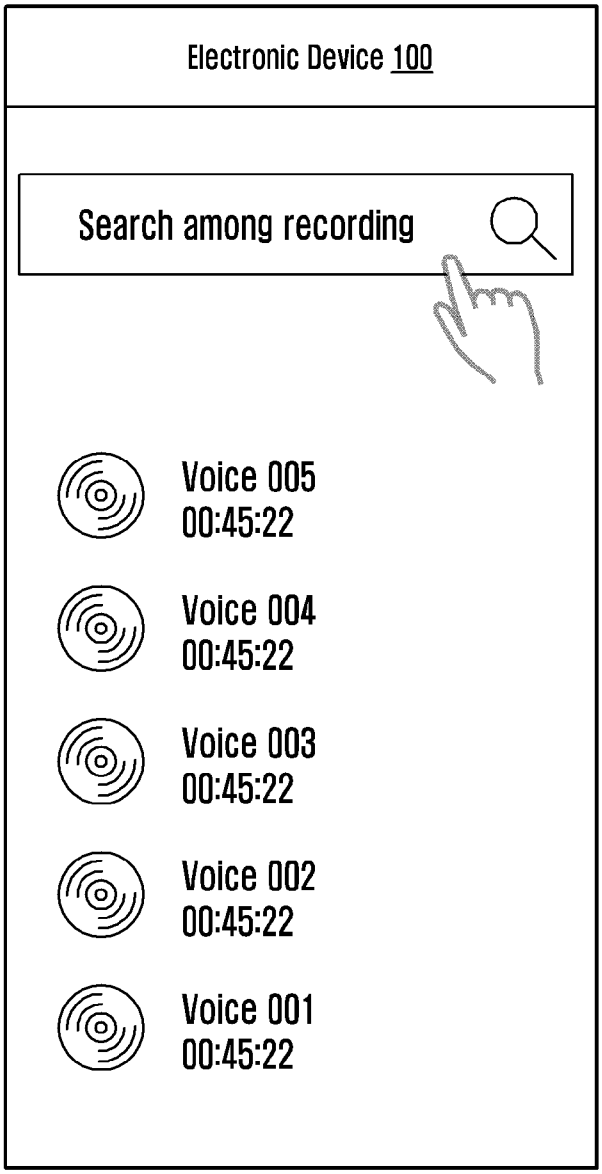
[Fig. 13A]



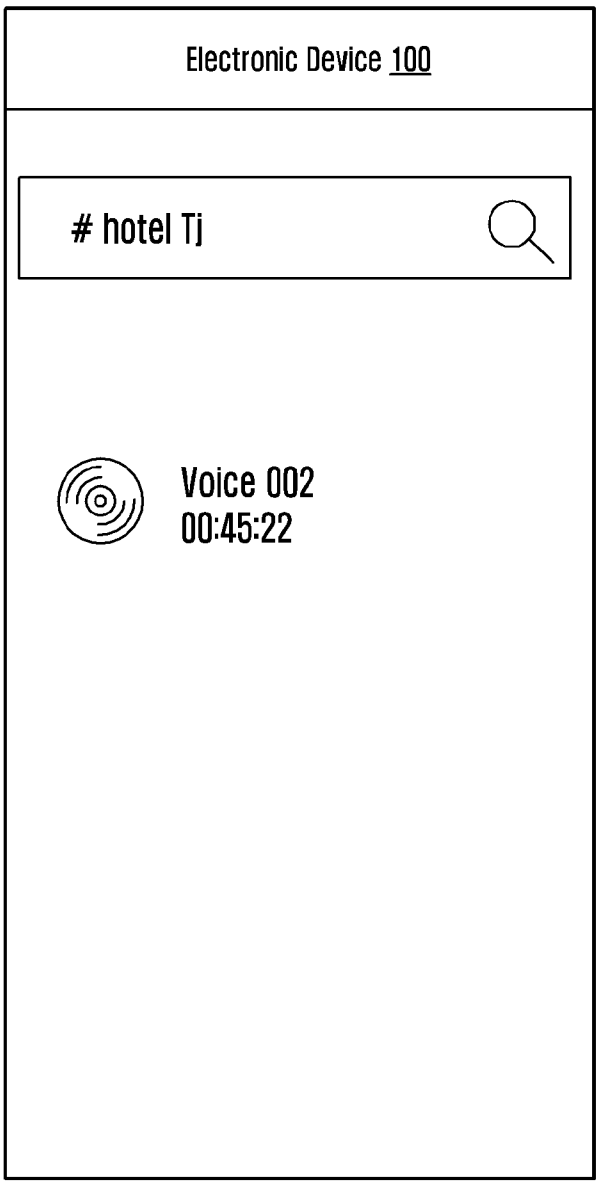
[Fig. 13B]


Electronic Device 100
Save recording
Voice 002
20th June
meeting 9am
room-7
hotel Tj
Saturday morning
+ Add new tag
save

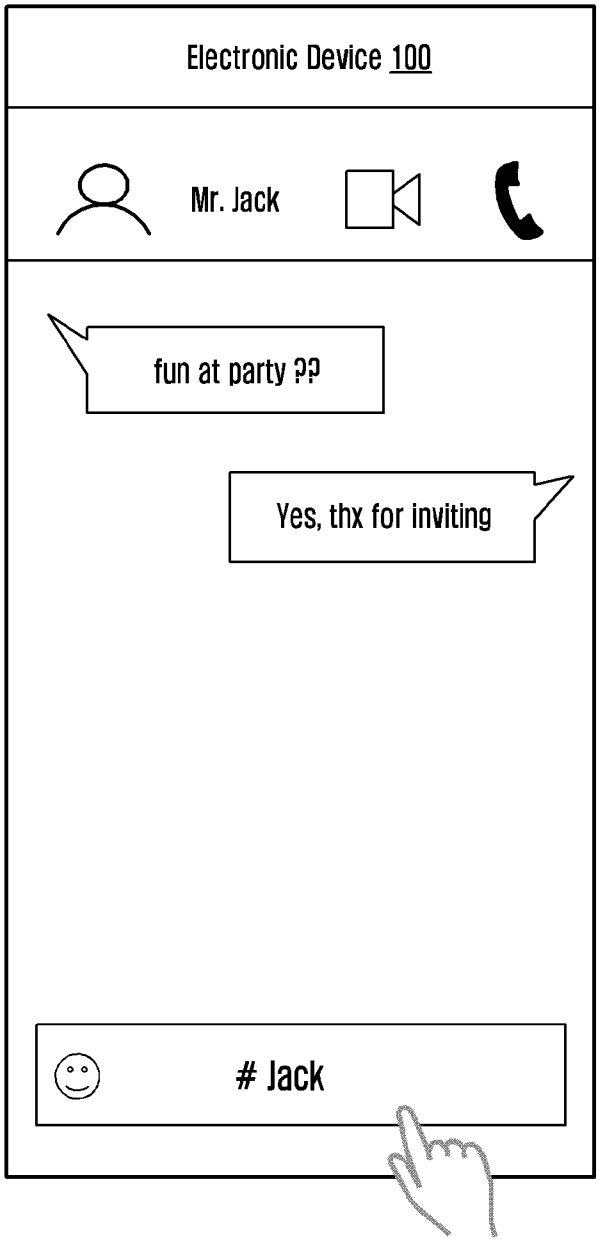
[Fig. 13C]


Electronic Device 100
Search among recording
Voice 005
00:45:22
Voice 004
00:45:22
Voice 003
00:45:22
Voice 002
00:45:22
Voice 001
00:45:22

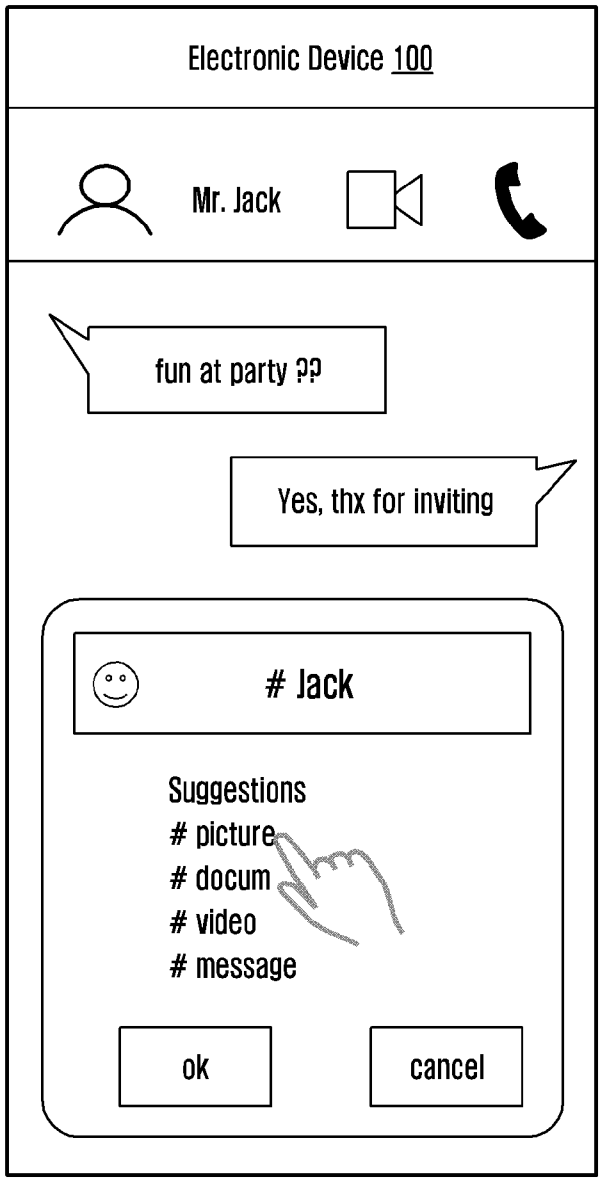
[Fig. 13D]



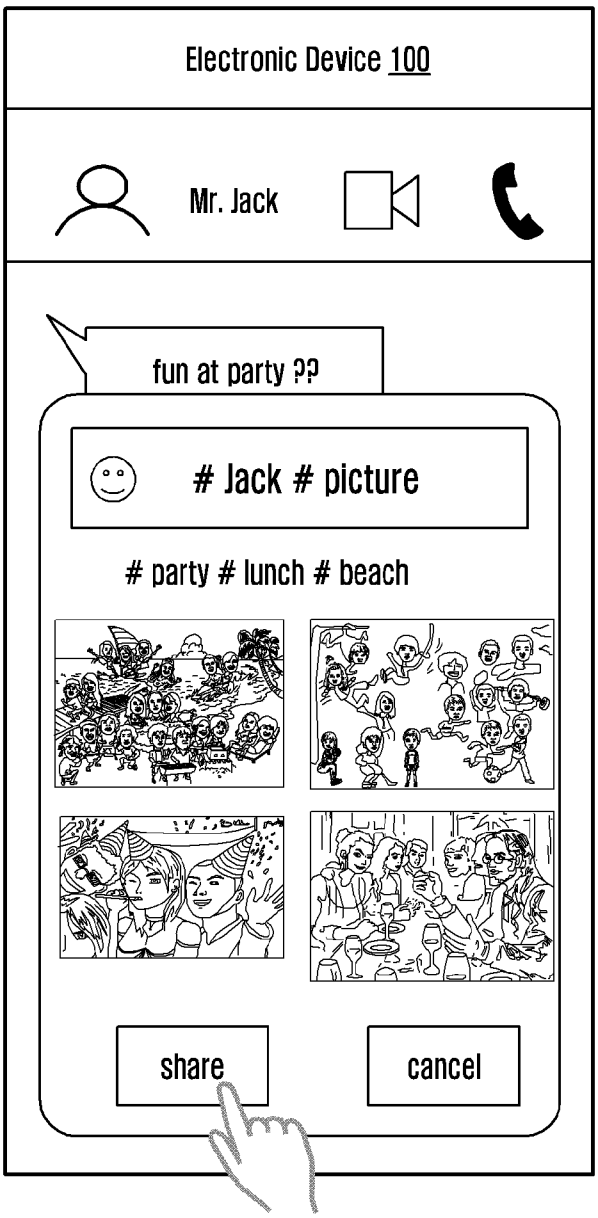
[Fig. 14A]


Electronic Device 100
Mr. Jack
fun at party ??
Yes, thx for inviting
Jack

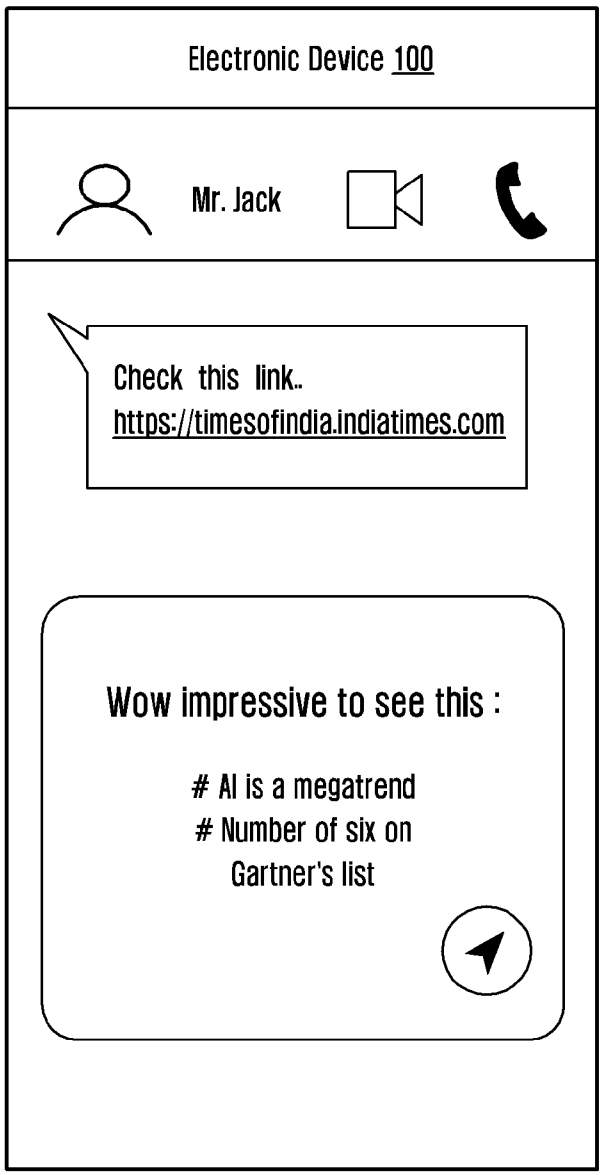
[Fig. 14B]


Electronic Device 100
Mr. Jack
fun at party ??
Yes, thx for inviting
Jack
Suggestions
picture
docum
video
message
ok
cancel

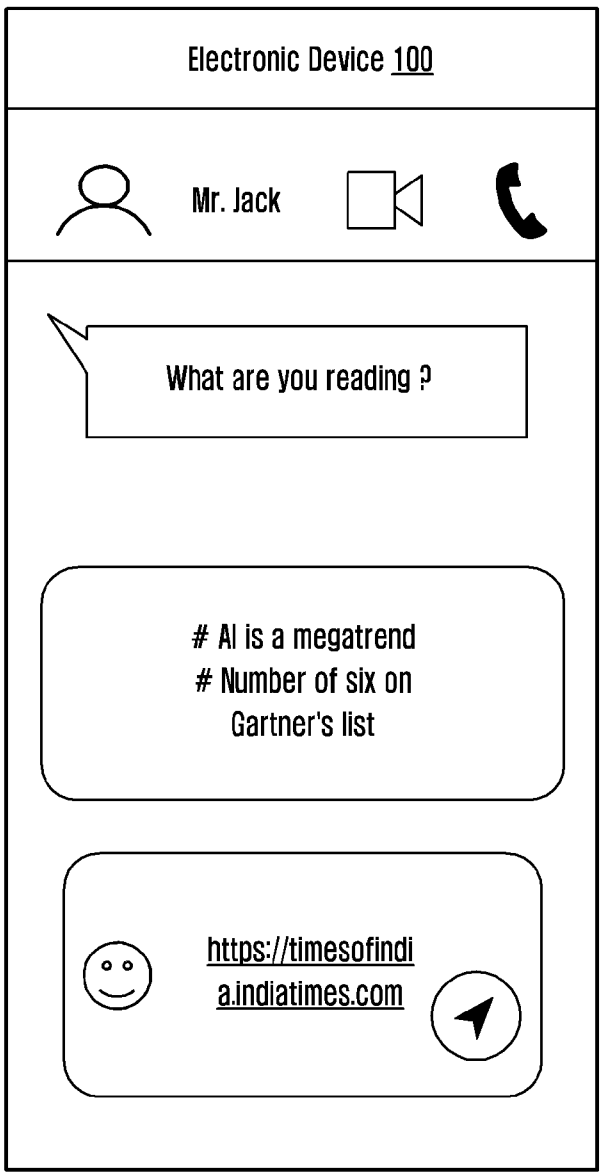
[Fig. 14C]


Electronic Device 100
Mr. Jack
fun at party ??
Jack # picture
party # lunch # beach
share
cancel

[Fig. 15A]


Electronic Device 100
Mr. Jack
Check this link..
https://timesofindia.indiatimes.com
Wow impressive to see this :
AI is a megatrend
Number of six on
Gartner's list

[Fig. 15B]


Electronic Device 100
Mr. Jack
What are you reading ?
AI is a megatrend
Number of six on
Gartner's list
https://timesofindi
a.indiatimes.com

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2020/000210

A. CLASSIFICATION OF SUBJECT MATTER

G06F 16/9535(2019.01)i, G06F 16/383(2019.01)i, G06F 16/583(2019.01)i, G06F 16/683(2019.01)i, G06F 3/08(2006.01)i, G06N 20/00(2019.01)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)
G06F 16/9535; G06F 17/30; G06F 3/01; G06K 9/00; G06K 9/62; G06K 9/66; G11B 27/22; H04N 21/81; G06F 16/383; G06F 16/583; G06F 16/683; G06F 3/08; G06N 20/00

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: metadata tag, automatically, intelligence, video, content, image, search, keyword, priority

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2010-0246965 A1 (BORIS EPSHTEIN et al.) 30 September 2010 paragraphs [0029], [0040]-[0041]; and claim 1	1-15
Y	US 2016-0283595 A1 (CAMFIND, INC.) 29 September 2016 paragraphs [0055], [0065], [0099], [0128], [0185], [0224], [0248]; and claim 16	1-15
A	US 2018-0012110 A1 (ACCENTURE GLOBAL SOLUTIONS LIMITED) 11 January 2018 paragraphs [0047]-[0058]	1-15
A	US 2016-0322081 A1 (RODICA SCHILERU) 03 November 2016 claims 1-18	1-15
A	US 2012-0047436 A1 (PATRICK GIBLIN) 23 February 2012 claims 1-11	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"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
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 April 2020 (20.04.2020)	**21 April 2020 (21.04.2020)**

Name and mailing address of the ISA/KR	Authorized officer
International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea	BYUN, Sung Cheal
Facsimile No. +82-42-481-8578	Telephone No. +82-42-481-8262

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2020/000210

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010-0246965 A1	30/09/2010	US 8433136 B2	30/04/2013
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		US 2019-0258683 A1	22/08/2019
US 2018-0012110 A1	11/01/2018	EP 3267362 A1	10/01/2018
		EP 3267368 A1	10/01/2018
		US 10210178 B2	19/02/2019
US 2016-0322081 A1	03/11/2016	US 10096342 B2	09/10/2018
		US 2019-0139577 A1	09/05/2019
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		US 2012-0239661 A1	20/09/2012
		US 8055688 B2	08/11/2011
		US 8126936 B1	28/02/2012
		US 8543622 B2	24/09/2013
		WO 2009-073858 A1	11/06/2009