

**TITLE: METHOD AND SYSTEM FOR DISPENSING MOISTURIZER TOWARD
ONE OR MORE PORTIONS OF A BODY**

DESCRIPTION

TECHNICAL FIELD

[0001] The disclosure related to the field of dispensers and more particularly to the method and system for dispensing moisturizer toward one or more portions of a body.

BACKGROUND

[0002] Good health is one of the key requirements of users while enjoying benefits of life. These days various types of infections are caused due to a relatively longer exposure of the body in a surrounding environment. As a precautionary move to avoid being affected from such infections, physicians may refer various types of lotions or moisturizers to the user to apply on affected parts of the body.

[0003] Normally, moisturizer is available in a market within a dispenser which is adapted to release the moisturizer on actuation. The dispenser can be a manual dispenser, an automated dispenser or a combination thereof. For example, the user generally gains access to the manual dispenser and actuate it manually to receive the moisturizer. Otherwise, the automated dispenser releases the moisturizer in the environment after regular intervals. At times, it is inconvenient for the user to access these dispensers at a required time.

[0004] Further, each user has its own personal medicinal requirements and may require applying the moisturizer to affected parts of the body at regular intervals. The existing dispensers are not suitable for the user as the user cannot carry the existing dispenser on its body or near the affected parts of the body so that the moisturizer can be automatically released toward the affected portions of the body.

[0005] In view of foregoing discussion, there exists a need for a method and a system for effectively and automatically dispensing the moisturizer to one or more portions of the body.

BRIEF DESCRIPTION OF THE FIGURES

[0006] In the accompanying figures, like reference numerals refer to identical or functionally similar elements throughout the separate views and together with the detailed description below

are incorporated in and form part of the specification, serve to further illustrate various embodiments and to explain various principles and advantages all in accordance with the systems and methods disclosed herein.

[0007] Figure 1 illustrates an example embodiment of a system architecture for releasing a predetermined amount of the moisturizer to a desired portion of a body of a user in accordance with an embodiment of a disclosure;

[0008] Figure 2 illustrates the example steps of a method for dispensing the moisturizer from the dispensation unit in accordance with an embodiment of the present disclosure;

[0009] Figure 3 is a flowchart illustrating a method of dispensing the moisturizer from the dispensation unit in view of various conditional parameters in accordance with an embodiment of the present disclosure;

[0010] Figures 4A and 4B illustrate example embodiments of the smart wearable device coupled with the dispensation unit in accordance with an embodiment of the present disclosure;

[0011] Figure 5 illustrates an example embodiment of a headwear configured to include the dispensation unit in accordance with an embodiment of the present disclosure;

[0012] Figures 6A and 6B illustrate example embodiments of a shirt coupled with a single dispensing container in accordance with an embodiment of the present disclosure;

[0013] Figures 7A and 7B illustrate example embodiments of a shirt coupled with a plurality of dispensing containers in accordance with an embodiment of the present disclosure;

[0014] Figures 8A and 8B illustrate example embodiments of a shirt coupled with the dispensation unit in accordance with an embodiment of the present disclosure;

[0015] Figures 9A and 9B illustrate different perspective views of the dispensation unit in accordance with an embodiment of the present disclosure;

[0016] Figure 10 illustrates an example embodiment of the dispensation unit in accordance with an embodiment of the present disclosure;

[0017] Figure 11 illustrates another embodiment of the dispensation unit 104 adapted to release the moisturizer in accordance with an embodiment of the present disclosure;

[0018] Figure 12 illustrates a perspective view of gear engagements within the dispensation unit of Figure 11 in accordance with an embodiment of the present disclosure;

[0019] Figure 13 illustrates an example embodiment of a system 1300 for dispensing the moisturizer in accordance with an embodiment of the present disclosure; and

[0020] Figures 14A, 14B and 14C are tables illustrating parameters required for a selection of the dispensation policy, input conditions for the dispensation policy and operational parameters for the dispensation unit respectively in accordance with one or more embodiments of the present disclosure.

[0021] Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of embodiments of the systems and methods disclosed herein.

BRIEF DESCRIPTION

[0022] Provided herein are a method and a system for dispensing moisturizer to a desired portion of a body.

[0023] In an embodiment, a method for dispensing the moisturizer to the desired portion of the body is disclosed. The method comprising:

- monitoring at least one of a physical parameter, an environmental parameter and a predefined conditional parameter corresponding to at least one user profile;

- determining a respective threshold value for each of the physical parameter, the environmental parameter and the predefined conditional parameter corresponding to at least one user profile;

- comparing a respective current value of the at least of the one condition of the physical parameter, the environmental parameter and the predefined conditional parameter with at least the respective threshold value;

- selecting at least one user-based policy based on the comparison wherein the at least one user-based policy defines a predetermined amount of moisturizer to be released to the desired portion of the body;

- selecting at least one dispensing container configured to release the predetermined amount of moisturizer; and

releasing the predetermined amount of moisturizer to the desired portion of the body.

[0024] In an embodiment, the method further comprising determining moisture content of the desired portion of the body and subsequently, releasing the predetermined amount of the moisturizer to the desired portion of the body to maintain hydration level of the skin.

[0025] In an embodiment, a dispensation unit comprising the dispensing container is disclosed. The dispensation unit includes a control unit configured to communicatively couple with a control unit of the smart wearable device to dispense the moisturizer.

[0026] In an embodiment, the dispensing unit comprises a plurality of dispensing containers, wherein each of the dispensing containers includes an inlet port, a flow detection sensor and an outlet port. The dispensing container further includes a first opener and a second opener, wherein actuation of the first opener is controlled by the control unit of the dispensation unit depending on an input received from the flow detection sensor. In an embodiment, a space is provided between the first opener and the second opener.

[0027] In an embodiment, the dispensation unit comprises a first spindle shaft, a second spindle shaft and a motor shaft operatively coupled to each other through gears. A dispensing container is disposed between the spindle shafts and the motor shaft in a manner that rotational movement of the spindle shafts and the motor shaft causes a release of the moisturizer from the dispensing container.

[0028] Figure 1 illustrates an example embodiment of a system architecture 100 for releasing the predetermined amount of the moisturizer to a desired portion of a body of a user in accordance with an embodiment of a disclosure.

[0029] The system 100 includes a smart wearable device 102 configured to communicate with at least one dispensation unit 104. Further the smart wearable device 102 is configured to communicatively couple to a mobile device 106. The system 100 includes an application server 108 configured to process, store and retrieve user profile related information, environmental related information and other parameters that can be used to determine requirement of releasing the moisturizer to the desired portion of the user body.

[0030] In an embodiment, the mobile device 106 and the smart wearable device 102 are communicatively coupled to each other through at least one of the communication technologies such as Bluetooth, WIFI, WLAN, and among other wireless communication technologies. Similarly, the smart wearable device 102 and the dispensation unit 104 are communicatively coupled to each other through at least one of the communication technologies such as Bluetooth, WIFI, WLAN, and among other wireless communication technologies. In an embodiment, the smart wearable device 102 is directly connected to the application server 108, through any one of the communication technologies.

[0031] In an embodiment, the mobile device 106 is configured to include a mobile application which can monitor activities of the smart wearable device 102 and receive data from the smart wearable device 102. The data is further transmitted to the application server 108 to process the data and processed data is being stored in a database 110. In an embodiment, the data includes but is not limited to, profile parameters of the user, sensor parameters and values, activity parameters, health parameters of the user, device configurations, user configurations for the smart wearable device 102 and the dispensation unit 104, dispensation policy, dispensation parameters, dispensation device parameters and among other data types.

[0032] Further, the smart wearable device 102 includes a primary controller unit 112, a primary communication module 114, a primary power unit 116, a scheduler 118, a sensor module 120 including a plurality of sensors, a display unit 122 and a memory 124. The primary communication module 114 is capable of communicating with the mobile device 106 and the dispensation unit 104. Further, the primary communication module 114 receives commands/instructions from the user's mobile device 106 (mobile application), wherein, these commands are executed at the primary controller unit 112 in time to time, and the processed data is stored in the memory 124.

[0033] In addition, the memory 124 of the smart wearable device 102 is configured to store the profile details of the user, sensor parameters and values, health parameters of the user, activity related information of the user, first set of instructions/commands/policies to be shared with dispensation unit 104, data relating to the dispensation unit 104 and the other types of data required for appropriate functioning of the smart wearable device 102 and the dispensation unit 104. In an embodiment, the profile details of the user include but is not limited to age, gender, skin complexion, any skin related data (for example, dehydration of skin, skin diseases if any). In an embodiment, the user can any time, insert and update the above profile details, through

the smart wearable device 102. In an embodiment, the skin complexion related data includes but is not limited to, light, fair, medium, olive, brown and black. The skin types may include a normal skin, a dry skin, an oily skin, a sensitive skin or any combination thereof.

[0034] In an embodiment, the scheduler 118 is configured to schedule notification to the user, and to apply the moisturizer. In an embodiment, the scheduler 118 works based on the dispensation policy. In another embodiment, scheduler 118 alerts and buzzes, automatically based on the instructions from the dispensation policy (executed by the primary controller unit 112).

[0035] In an embodiment, the primary power unit 116 provides sufficient energy to the components of the smart wearable device 102. In an embodiment, primary power unit 116 is a rechargeable battery.

[0036] In an embodiment, the sensor module 120 includes one or more sensors including but is not limited to an accelerometer, a gyroscope, a magnetometer, a barometric pressure sensor, temperature sensors (to detect the temperature level of the skin as well as, the external temperature), a heart rate monitor, a skin conductance sensor, an ultraviolet radiation sensor, a GPS module and other sensors based on the output of which the dispensation unit 104 is configured to release the moisturizer. The one or more sensors are used either alone or in combination to detect the condition of skin, external environment and location of the user. In another embodiment, these sensors may be present in the smart wearable device 102. In a yet another embodiment, the sensor module 120 is an individual standalone, self-powered sensing unit which can capable of performing the designated task. The self-powered sensor unit (for example, placed in different parts of the body) can collect the data and shares the data with the smart wearable device 102 through any known communication methods/standards. In an embodiment, the smart wearable device 102 may maintain the log of connected/paired devices.

[0037] Further, the data from plurality of sensors are collected by the smart wearable device 102 and appropriately processed by the primary controller unit 112 and saved in the memory 124 of the smart wearable device 102. The sensor data is further forwarded to the application server 108 (through the mobile device 106). In an embodiment, the primary controller unit 112 is capable of comparing the user profile data with real-time data received from the sensors. In addition, primary controller unit 112 further detects any considerable deviation in sensor data values from respective threshold values of the parameters. Based on the sensor data value and

user profile data, the primary controller unit 112 analyses the dispensation policy. The primary controller unit 112 further identifies one set of instructions from the dispensation policy and share with the dispensation unit 104.

[0038] In an embodiment, the primary controller unit 112 determines the nature, present condition of the user's skin and quality of skin through the sensor data. In another embodiment, the combination of temperature sensor, conductance sensor, moisture sensor and ultraviolet radiation sensor may be used to determine the present condition of the user's skin.

[0039] In a yet another embodiment, the primary controller unit 112 is configured to determine a type of moisturizer to be applied to the skin, wherein the user can avoid skin related problems such as dehydration, sun burn (redness of skin, burning of affected areas, tightness of skin, itching and peeling of skin), change in skin color due to excessive heat, premature wrinkles on the skin.

[0040] The primary controller unit 112 further selects a suitable dispensation policy for the present condition of user's skin and send the instructions to the dispensation unit 104, to appropriately release the moisturizer from the dispensing unit. An example dispensation policy may include, based on a present condition of user's skin, a type of moisturizer to be applied, a quantity of moisturizer to be released from the dispensation unit 104, quantity of the moisturizer to be applied, the frequency (for example, in day, how many times the user has to apply the moisturizer) in which the moisturizer to be applied, the expected time taken to dispense the moisturizer from the dispensation unit 104, application areas of subject moisturizer, the method of applying the subject moisturizer in the affected areas, etc. In another embodiment, the first set of instructions (retrieved from selected dispensation policy) are shared with the dispensation unit 104, for further processing of the command. A display unit is present in the smart wearable device 102 to appropriately display the process-oriented information to the user.

[0041] In an embodiment, the dispensation unit 104 comprises a secondary communication module 130, a secondary controller unit 132, a secondary power unit 134 and a dispensing container 136. The secondary communication module 130 receives instructions from the smart wearable device 102. Further, commands are forwarded to the secondary controller unit 132. The commands are executed by the secondary controller unit 132 and the dispensing container

136 is appropriately operated based on the executed command. The secondary power unit 134 supplies energy to all the components of the dispensation unit 104.

[0042] Figure 2 illustrates the example steps of a method 200 for dispensing the moisturizer from the dispensation unit 104 in accordance with an embodiment of the present disclosure. The method 200 starts at step 205, wherein inputs are received from the user. In an embodiment, the mobile device 106 is capable of collecting input related data from the user. The input data that include, but is not limited to user's name, age, gender, skin complexion data, allergic data, skin type data, list of moisturizers already used by the user to prevent skin related problems, skin related infection/diseases if any, the period of such skin infection/diseases, treatment related information, any other hereditary related information relating to skin, duration in which the user is exposed to sun light, environment in which the user usually occupy (AC, non-AC). The mobile application is configured to capture all information relating to the skin of the user. In an embodiment, the smart wearable device 102 is capable of collecting such user data over voice or display input. In an embodiment, the smart wearable device 102 may initiate a questionnaire session before initiating the monitoring operation. The database 110 stores all information relating to the user (user profiling) and further a copy of this data is stored in the memory of the smart wearable device 102.

[0043] At step 210, the application server 108 is configured to further analyze the user profile data, against the plurality of health-related parameters. These health parameters are stored in the database 110. At step 215, the application server 108 determines the skin related data based on the user data and current environment data. The application server 108 further fetches and compares the health parameters with the user data to determine and suggest suitable dispensation policy for the user.

[0044] At step 220, the application server 108 shall configure the smart wearable device 102 settings and also the dispensation unit 104 settings, either directly or through the mobile device 106. In an embodiment, the dispensation policy details are primarily stored in the application server 108. In another embodiment, these dispensation policy details are shared with the smart wearable device 102 and stored in its memory for quick retrieval of information. In yet another embodiment, the application server 108 predicts a plurality of dispensation policies for the user, based on the user profile data. Further, these policies are shared with the user's smart wearable device 102 based on need and requirement. In a yet another embodiment, the smart wearable device 102 is a standalone equipment, which is capable of analysing the user profile

data and real-time environment data. The memory of smart wearable device 102 further stores many dispensation policies. The dispensation policy is primarily considered based on following parameters namely, age of the user, temperature and moisture at user's location, location of the user (derived through GPS), skin temperature of the user, skin tone of the user, Ultraviolet radiation in user's location, skin complexion of the user.

[0045] At step 225, the smart wearable device 102 executes the dispensation policy relevant for the user's condition/state. The smart wearable device 102 further shares the dispensation policy with the dispensation unit 104. The dispensation unit 104 further triggers the dispensing container 136 to dispense the precise amount of moisturizer.

[0046] Figure 3 illustrates the steps of a method 300 of dispensing the moisturizer from the dispensation unit 104 in view of various conditional parameters in accordance with an embodiment of the present disclosure. The method initiates at step 305, wherein the smart wearable device 102 monitors the external environment and body condition of the user, through the plurality of sensors and connected sensors.

[0047] At step 310, the smart wearable device 102 receives one or more inputs from the plurality of sensors. The smart wearable device 102 collects all sensor data captured in real-time for further processing. At step 315, the smart wearable device 102 checks whether any change in values are detected in the environment data or the health data of the user. If any change is detected then the control is transferred to step 320, otherwise, the control is transferred to step 325, wherein no further action is performed.

[0048] At step 320, the smart wearable device 102 further compares the real-time data (both environment data and health data of the user) with the user pre-set configuration data. Any delta change in value is recorded/identified by the processing unit and further stored in the memory of smart wearable device 102.

[0049] At step 330, the smart wearable device 102 determines a suitable dispensation policy for the current condition of the user. In an embodiment, the memory of the smart wearable device 102 stores a plurality of policies for dispensing the moisturizer. The application server 108 determines suitable dispensation policy for the subject condition of the user. At step 335, the smart wearable device 102 shares the details of suitable dispensation policy selected for the present condition of the user. Further, the smart wearable device 102 updates the configuration settings for dispensation unit 104.

[0050] At step 340, the dispensation unit 104 receives the instructions (updated dispensation policy, selected by the processing unit, only for the user's current condition) from the smart wearable device 102 and updates configuration settings. The dispensation unit 104 further triggers the dispensing container 136 to dispense the moisturizer as stated in the dispensation policy. In an embodiment, one or more dispensation policies can be configured for plurality of user's usual locations (home, work etc). The dispensation unit 104 has a pump mechanism to release adequate amount of moisturizer based on the dispensation policy.

[0051] Figures 4A and 4B illustrate example embodiments of the smart wearable device 102 coupled with the dispensation unit 104 in accordance with an embodiment of the present disclosure. In an embodiment, smart wearable device 102 of Figure 4A is a vibration ring whereas the smart wearable device 102 of Figure 4B is a smart watch. Further, the dispensation unit 104 is coupled to the smart wearable device 102 of the Figures 4A and 4B.

[0052] Figure 5 illustrates an example embodiment of a headwear 502 configured to include the dispensation unit 104 in accordance with an embodiment of the present disclosure. The headwear can include a plurality of sensors to determine the requirement of releasing the moisturizer to one or more specific portions of the head. The headwear coupled with the dispensation unit 104 can be used for long walks, cycling competitions, racing and other sporting or non-sporting activities which require to maintain adequate amount of hydration level of the user during extreme environmental conditions.

[0053] Figures 6A and 6B illustrate example embodiments of a shirt 602 coupled with a single dispensing container 604 in accordance with an embodiment of the present disclosure. Figure 6A illustrates front view of the shirt 602 and Figure 6B illustrates back/rear view of the shirt 602. The rear view illustrates that a dispensing container 604 is coupled to a dispensing tube 612. Further, an end of the dispensing tube 612 is directed toward an end of a right sleeve of the shirt 602.

[0054] Figures 7A and 7B illustrate example embodiments of a shirt 602 coupled with a plurality of dispensing containers 604 in accordance with an embodiment of the present disclosure. Figure 7A illustrates front view of the shirt 602 and Figure 7B illustrates back/rear view of the shirt 602. The rear view illustrates that the dispensing container 604a is coupled to a dispensing tube 712, whereas the dispensing container 604b is coupled to a dispensing tube

714. Further, ends of the dispensing tubes 712 and 714 are directed toward ends of left sleeve and right sleeve of the shirt 602 respectively.

[0055] Figures 8A and 8B illustrate example embodiments of a shirt 602 coupled with the dispensation unit 104 in accordance with an embodiment of the present disclosure. Figure 8A illustrate front view of the shirt 602 and Figure 8B illustrates back/rear view of the shirt 602. The rear view illustrates the dispensation unit 104 coupled with a dispensing tube 802 and a dispensing tube 804. Specifically, both the dispensing tubes 802 and 804 releases the moisturizer from the same dispensation unit 104. Further, ends of the dispensing tubes 802 and 804 are directed toward the ends of left sleeve and right sleeve of the shirt 602 respectively.

[0056] In an embodiment, the dispensation unit 104 is adapted to pump an adequate amount of moisturizer on to the hands of the user, whenever requested by the user. The user can primarily apply the moisturizer on the face or hands or legs or other parts of the body. In an embodiment, an algorithm is employed to determine the adequate amount of moisturizer on the hands of the user. The algorithm automatically determines how much moisturizer to be pumped from the dispensation unit 104 (that is pumping through a small nozzle), a scheduler 118 (timer) is placed to notify and alert the user in right time. In an embodiment, the dispensation of moisturizer is automated through suitable device means.

[0057] Figures 9A and 9B illustrate different perspective views of the dispensation unit 104 in accordance with an embodiment of the present disclosure. Figure 9A illustrates a top perspective view and Figure 9B illustrates a perspective side view of the dispensation unit 104.

[0058] Figure 10 illustrates an example embodiment of the dispensation unit 104 in accordance with an embodiment of the present disclosure. The dispensation unit 104 includes a housing within which three dispensing containers namely 1002a, 1002b and 1002c are disposed. Each dispensing container 1002 is configured to include moisturizer or any other product in liquid/gaseous form required to be dispensed to the desired portion of the user body. In an embodiment, each dispensing container includes a same kind of product whereas in another embodiment, each dispensing container may include a respective product.

[0059] Further each dispensing container 1002 is adapted to include an inlet port 1004 for re-filling the dispensing container 1002. For example, a connecting tube (not shown) between a moisturizer source and the inlet port 1004 is provided and the moisturizer is pumped into the dispensing container 1002 (1002a, 1002b and 1002c) whenever the dispensing container 1002

is in an empty state or about to an empty state. At an outlet port 1006 of each dispensing container 1002 a respective flow control sensor 1008a, a first opener 1010a and a second opener 1012a (with respect to dispensing container 1002a) is provided. Furthermore, an empty space is provided between the first opener 1010a and the second opener 1012a. The empty space when filled with the moisturizer during operation of the dispensation unit 104, facilitates release of the moisturizer with a relatively higher pressure. As a result, the moisturizer can travel a relatively longer distance through the connecting dispensing tubes.

[0060] During operation, on detection of a condition such as that when the user having a fair complexion at a temperature of around 30 to 35 degrees is exposed to sun rays for a relatively longer duration, the primary controller unit 112 of the smart wearable device 102 is configured to send an instruction to the dispensation unit 104 to release the predetermined amount of moisturizer. Subsequently (with respect to dispensing container 1002a), a first opener 1010a is actuated and moisturizer from the dispensing container 1002a is flown within the empty space available between the first opener 1010a and the second opener 1012a. The flow control sensor 1008a detects the quantity of the moisturizer to be released and accordingly, a signal is sent to the primary controller unit 112 after closing the first opener 1010a. Subsequently, the moisturizer is flown into the connecting pipe 1014 by opening of the second opener 1012.

[0061] In an embodiment, the connecting pipe 1014 includes three ports and each port is coupled to a respective outlet port 1008a of the dispensing container 1002a. The connecting pipe 1014 is adapted to include moisturizer releasing ports which are coupled with respective ends of the dispensing tubes 1016a and 1016b. The dispensing tubes 1016a and 1016b act as a guiding channel to direct the flow of the moisturizer to the desired portion of the body.

[0062] Figure 11 illustrates another embodiment of the dispensation unit 104 adapted to release the moisturizer in accordance with an embodiment of the present disclosure. The dispensation unit 104 includes a dispensing container 1102 adapted to be supported on a dispensing container holder 1104. The dispensing container 1102 includes an inlet port 1106 and an outlet port 1108. The inlet port 1106 is used to refill the dispensing container 1102 whereas the outlet port 1108 is coupled to either a dispensing tube or to a connecting pipe adapted to couple to a plurality of dispensing tubes. A flow control sensor 1110 is provided at the outlet port 1108, wherein the flow control sensor 1110 monitors and detects the quantity of the moisturizer being released through the outlet port 1108 accordingly, a signal is sent to the microcontroller unit 1132 of dispensation controller unit 1140. Further the dispensing container 1102 is supported

between two spindles 1120a, 1120b and on a motor shaft 1130. The two spindles (1120a and 1120b) are adapted to rotate in opposite direction with respect to the rotational direction of the motor shaft 1130 due to configuration of gear settings.

[0063] On receiving a signal to release the moisturizer from the primary controller unit 112, a microcontroller 1132 of the dispensation controller unit 1140 is configured to provide activation signal to the motor 1142. The rotational movement of the motor shaft 1130 coupled with the motor 1142 is transferred to the rotational movement of spindles 1120a and 1120b through the engagement of first gear 1152 with a second gear 1154 and a third gear 1156. The moisturizer is dispensed through the outlet port 1108 and flow control sensor 1110 further monitors and controls the flow of moisturizer through the outlet port 1108. In an embodiment, the signal to release the moisturizer from the dispensing container 1102 may include, dispensation parameters, for example, the signal includes, time in which the motor should rotate (includes both start time, end time), quantity of moisturizer to be dispensed, speed of the motor. In another embodiment, the values of motor 1142, motor shaft 1130, gears (first, second and third), spindles 1120 are proportionately selected to attain and achieve smooth operation of dispensing container 1102 and dispensation of moisturizer.

[0064] Figure 12 illustrates a perspective view of gear engagements within the dispensation unit 104 of Figure 11 in accordance with an embodiment of the present disclosure. As illustrated, the rotation of the first gear 1152 in an anti-clock wise direction causes rotational movement of the second gear 1154 and the third gear 1156 in a clock-wise direction. As a result, spindles 1120a and 1120b mechanically attached to the second gear 1154 and third gear 1156 respectively, rotate in the clockwise direction which causes a considerable force on the dispensing container 1102. The force thus exerted causes a relatively faster release of the moisturizer from the outlet port 1108. Further, as soon as the predetermined amount of the moisturizer is released from the dispensing container 1102, the flow control sensor 1110 sends a signal to the micro controller 1132 of the dispensation controller unit 1140. Subsequently, the microcontroller 1132 is configured to stop rotational movement of the motor 1142.

[0065] In an embodiment, the gears used are of a spur type gear. Further, radius of the first gear 1152 is approximately 3 cm, whereas the second and third gears (1154, 1156) are of same radius approximately to 2 cm. In another embodiment, the second and third gears have different radius. Furthermore, length of the motor shaft 1130 is 7 cm whereas length of shafts of spindles 1120 is 4 cm. In addition, width of shaft and spindle shafts is approximately $\frac{1}{2}$

inch. In an embodiment, the battery is a coin type battery based on lithium ion composition. The battery is approximately 20 mm in size and has a power capacity of 3V with a capacity range of 220.0mAh - 240.0mAh. In addition, the dispensing tube is a peripheral venous catheter (PVC) type pipe wherein a dispensation outlet size is approximately 1cm and a diameter of the dispensing tube is approximately 1.5 – 2 cm. Although dimensions of various parts are disclosed herein, any prudent person may modify the dimensions of the various parts without affecting the scope of present disclosure.

[0066] Figure 13 illustrates an example embodiment of a system 1300 for dispensing the moisturizer in accordance with an embodiment of the present disclosure. The system 1300 includes a central dispensation controller unit 1302 configured to communicatively couple to a plurality of dispensation units 104 disposed at various positions/parts of the body. In an embodiment, the smart wearable device 102 is in communication with a microcontroller 1304 of the central dispensation controller unit 1302 through a communication module 1306. Whenever, there is requirement to dispense the moisturizer to a specific portion of the body, the central dispensation controller unit 1302 releases the moisturizer through the dispensation unit 104 located close to the specific portion of the body. In addition, to save power requirements of the dispensation unit 104 and make the dispensation units 104 a relatively compact in size, the central dispensation controller unit 1302 is configured to supply power to the plurality of dispensation unit 104 through respective power lines from a battery 1308. Furthermore, each dispensation unit 104 is communicatively coupled to the central dispensation controller unit 1302 through a data line in order to receive signal from the respective flow sensors.

[0067] Figures 14A, 14B and 14C are tables illustrating parameters required for a selection of the dispensation policy, input conditions for the dispensation policy and operational parameters for the dispensation unit respectively in accordance with one or more embodiments of the present disclosure. Specifically, a table 1402 (in Figure 14A) indicates various parameters and their respective values or range of values whatever the case may be, required for determination of an appropriate dispensation policy. The dispensation policy can be based on a single parameter or can be based on a combination of the plurality of parameters and respective threshold values.

[0068] In an exemplary embodiment, a table 1404 (in Figure 14B) illustrates input conditions of a particular dispensation policy and a table 1406 (in Figure 14C) illustrates operational

parameters of the dispensation unit when the input conditions of the particular dispensation policy are fully met. As illustrated in the table 1404, the dispensation policy requires the values of the parameters such as location, internal temperature of the body, external temperature, evaporation rate, UV index, user skin type, age of the user, gender of the user, skin related information, moisturizer application area and frequency of the application of the moisturizer at the moisturizer application area so as to be activated. Upon activation, the dispensation policy may indicate or refer to one or more operational parameters for the dispensation unit.

[0069] Further, the table 1406 illustrates various operational parameters selected for the operations of the dispensation unit once the dispensation policy is selected. For example, the table 1406 indicates the selection of the appropriate dispensing container, power requirements to rotate the motor to release the moisturizer and/or lotion as per a mandate of the dispensation policy and frequency of release of the moisturizer/lotion.

[0070] The methods and systems described herein may be deployed in part or in whole through network infrastructures. The network infrastructure may include elements such as computing devices, servers, routers, hubs, firewalls, clients, personal computers, communication devices, routing devices and other active and passive devices, modules and/or components as known in the art. The computing and/or non-computing device(s) associated with the network infrastructure may include, apart from other components, a storage medium such as flash memory, buffer, stack, RAM, ROM and the like. The processes, methods, program codes, instructions described herein and elsewhere may be executed by one or more of the network infrastructural elements. The methods and systems described herein may be adapted for use with any kind of private, community, or hybrid cloud computing network or cloud computing environment, including those which involve features of software as a service (SaaS), platform as a service (PaaS), and/or infrastructure as a service (IaaS).

[0071] The methods, program codes, and instructions described herein and elsewhere may be implemented on a cellular network having multiple cells. The cellular network may either be frequency division multiple access (FDMA) network or code division multiple access (CDMA) network. The cellular network may include mobile devices, cell sites, base stations, repeaters, antennas, towers, and the like. The cell network may be a GSM, GPRS, 3G, EVDO, mesh, or other networks types.

[0072] The methods, program codes, and instructions described herein and elsewhere may be implemented on or through mobile devices. The mobile devices may include navigation devices, cell phones, mobile phones, mobile personal digital assistants, laptops, palmtops, netbooks, pagers, electronic books readers, music players and the like. These devices may include, apart from other components, a storage medium such as a flash memory, buffer, RAM, ROM and one or more computing devices. The computing devices associated with mobile devices may be enabled to execute program codes, methods, and instructions stored thereon. Alternatively, the mobile devices may be configured to execute instructions in collaboration with other devices. The mobile devices may communicate with base stations interfaced with servers and configured to execute program codes. The mobile devices may communicate on a peer-to-peer network, mesh network, or other communications network. The program code may be stored on the storage medium associated with the server and executed by a computing device embedded within the server. The base station may include a computing device and a storage medium. The storage device may store program codes and instructions executed by the computing devices associated with the base station.

[0073] The computer software, program codes, and/or instructions may be stored and/or accessed on machine readable media that may include: computer components, devices, and recording media that retain digital data used for computing for some interval of time; semiconductor storage known as random access memory (RAM); mass storage typically for more permanent storage, such as optical discs, forms of magnetic storage like hard disks, tapes, drums, cards and other types; processor registers, cache memory, volatile memory, non-volatile memory; optical storage such as CD, DVD; removable media such as flash memory (e.g. USB sticks or keys), floppy disks, magnetic tape, paper tape, punch cards, standalone RAM disks, Zip drives, removable mass storage, off-line, and the like; other computer memory such as dynamic memory, static memory, read/write storage, mutable storage, read only, random access, sequential access, location addressable, file addressable, content addressable, network attached storage, storage area network, bar codes, magnetic ink, and the like.

[0074] The methods and systems described herein may transform physical and/or or intangible items from one state to another. The methods and systems described herein may also transform data representing physical and/or intangible items from one state to another.

[0075] The elements described and depicted herein, including in flow charts and block diagrams throughout the figures, imply logical boundaries between the elements. However,

according to software or hardware engineering practices, the depicted elements and the functions thereof may be implemented on machines through computer executable media having a processor capable of executing program instructions stored thereon as a monolithic software structure, as standalone software modules, or as modules that employ external routines, code, services, and so forth, or any combination of these, and all such implementations may be within the scope of the present disclosure. Examples of such machines may include, but may not be limited to, personal digital assistants, laptops, personal computers, mobile phones, other handheld computing devices, medical equipment, wired or wireless communication devices, transducers, chips, calculators, satellites, tablet PCs, electronic books, gadgets, electronic devices, devices having artificial intelligence, computing devices, networking equipment, servers, routers and the like. Furthermore, the elements depicted in the flow chart and block diagrams or any other logical component may be implemented on a machine capable of executing program instructions.

[0076] It will be appreciated that the various steps identified and described above may be varied, and that the order of steps may be adapted to particular applications of the techniques disclosed herein. All such variations and modifications are intended to fall within the scope of this disclosure. As such, the depiction and/or description of an order for various steps should not be understood to require a particular order of execution for those steps, unless required by a particular application, or explicitly stated or otherwise clear from the context.

[0077] The methods and/or processes described above, and steps associated therewith, may be realized in hardware, software or any combination of hardware and software suitable for a particular application. The hardware may include a general- purpose computer and/or dedicated computing device or specific computing device or particular aspect or component of a specific computing device. The processes may be realized in one or more microprocessors, microcontrollers, embedded microcontrollers, programmable digital signal processors or other programmable device, along with internal and/or external memory. The processes may also, or instead, be embodied in an application specific integrated circuit, a programmable gate array, programmable array logic, or any other device or combination of devices that may be configured to process electronic signals. It will further be appreciated that one or more of the processes may be realized as a computer executable code capable of being executed on a machine-readable medium.

[0078] The computer executable code may be created using a structured programming language such as C, an object oriented programming language such as C++, or any other high-level or low-level programming language (including assembly languages, hardware description languages, and database programming languages and technologies) that may be stored, compiled or interpreted to run on one of the above devices, as well as heterogeneous combinations of processors, processor architectures, or combinations of different hardware and software, or any other machine capable of executing program instructions.

[0079] Thus, in one aspect, methods described above and combinations thereof may be embodied in computer executable code that, when executing on one or more computing devices, performs the steps thereof. In another aspect, the methods may be embodied in systems that perform the steps thereof and may be distributed across devices in a number of ways, or all of the functionality may be integrated into a dedicated, standalone device or other hardware. In another aspect, the means for performing the steps associated with the processes described above may include any of the hardware and/or software described above. All such permutations and combinations are intended to fall within the scope of the present disclosure.

[0080] The method steps of the implementations described herein are intended to include any suitable method of causing such method steps to be performed, consistent with the patentability of the following claims, unless a different meaning is expressly provided or otherwise clear from the context. So, for example performing the step of X includes any suitable method for causing another party such as a remote user, a remote processing resource (e.g., a server or cloud computer) or a machine to perform the step of X. Similarly, performing steps X, Y and Z may include any method of directing or controlling any combination of such other individuals or resources to perform steps X, Y and Z to obtain the benefit of such steps. Thus, method steps of the implementations described herein are intended to include any suitable method of causing one or more other parties or entities to perform the steps, consistent with the patentability of the following claims, unless a different meaning is expressly provided or otherwise clear from the context. Such parties or entities need not be under the direction or control of any other party or entity and need not be located within a particular jurisdiction.

[0081] The use of the terms "a" and "an" and "the" and similar referents in the context of describing the disclosure (especially in the context of the following claims) is to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are

to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein may be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate the disclosure and does not pose a limitation on the scope of the disclosure unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the disclosure.

[0082] While the foregoing written description enables one of ordinary skill to make and use what is considered presently to be the best mode thereof, those of ordinary skill will understand and appreciate the existence of variations, combinations, and equivalents of the specific embodiment, method, and examples herein. The disclosure should therefore not be limited by the above described embodiment, method, and examples, but by all embodiments and methods within the scope and spirit of the disclosure. All documents referenced herein are hereby incorporated by reference.

Claims

We claim,

1. A method for dispensing moisturizer towards one or more portions of a body, the method comprising:

determining nature, present condition of user's skin and quality of the user's skin through sensor data by using a controller (112) of a smart wearable device (102), wherein the sensor data is received from a plurality of sensor including a temperature sensor, conductance sensor, moisture sensor and ultraviolet radiation sensor;

receiving an instruction from the controller unit (112) of the smart wearable device (102) to release a predetermined amount of the moisturizer to the one or more portions of the body;

determining, by a controller unit of a dispensation unit (104), at least one outlet port (1108) of a dispensing container (136) to release the predetermined amount of the moisturizer thereof;

actuating a first opener (1010) coupled to the at least one outlet port (1108) of the dispensing container (136);

activating at least one actuating mechanism to apply force on an external surface of the dispensing container (136) to release the predetermined amount of the moisturizer from the first opener (1010) to the one or more portions of the body through the at least one outlet port and the at least one guiding channel (1016), wherein the at least one guiding channel (1016) has an inlet coupled to the at least one outlet port (1108) of the dispensing container (136) and an outlet disposed near the one or more portions of the body, wherein the at least one actuating mechanism comprises a motor (1142) coupled to a first spindle (1120a) and a second spindle (1120b), through at least three interlocked gears, wherein activating the at least one actuating mechanism comprising:

actuating the motor (1142) causing a rotational movement of the first spindle (1120a) and the second spindle (1120b) over external surface of the dispensing container (136), wherein rotation of first gear (1152) in an anti-clock wise direction causes rotational movement of a second gear (1154) and third gear (1156) in a clock-wise direction, wherein the first spindle (1120a) and the second spindle (1120b) mechanically attached to the second gear (1154) and the third gear (1156) respectively, rotate in the clockwise direction which causes a force on the dispensing container (136);

releasing the moisturizer from the dispensing container (136) in accordance with the rotational movement of the first spindle (1120a) and the second spindle (1120b); and

releasing the moisturizer to the one or more portions of the body.

2. The method as claimed in claim 1, further comprising: releasing the moisturizer to the one or more portions of the body in accordance with a pre-defined time and frequency respectively set for the moisturizer release, wherein said time and frequency respectively are pre-defined based on at least one of: type of a skin of a user and an environmental condition.
3. The method as claimed in claim 1, further comprising: monitoring, by the controller of the dispensation unit (104), an output of a flow control sensor (1110);
 computing a quantity of the moisturizer already released from the dispensing container (136) based on at least the output of the flow control sensor (1110); and
 deactivating the at least one actuating mechanism to stop further release of the moisturizer from the dispensing container (136), when the computed quantity of the moisturizer is equivalent to the predetermined amount of the moisturizer.
4. The method as claimed in claim 1, wherein the dispensation unit (104) is configured on at least one item adapted to be worn by a user in a manner such that the outlet of the at least one guiding channel faces skin of the user.
5. The method as claimed in claim 1, wherein the controller unit of the dispensation unit (104) is a central controller unit configured to communicatively couple to a plurality of controller units of a plurality of dispensation units respectively.
6. The method as claimed in claim 5, further comprising: selecting the dispensing container (136) by the central controller unit to release the moisturizer, wherein the dispensing container (136) is selected from dispensing containers of the plurality of dispensation units.
7. A dispensation unit for dispensing moisturizer towards one or more portions of a body, the dispensation unit comprising:
 a controller (132) unit configured to receive an instruction from a controller unit of a smart wearable device (102) to release a predetermined amount of the moisturizer to the one or more portions of the body;
 a dispensing container (136) disposed within the dispensation unit (104), wherein the dispensing container (136) comprises at least one outlet port to release the predetermined amount of the moisturizer thereof;
 a first opener (1010) coupled to the at least one outlet port of the dispensing container (136), wherein the controller unit of the dispensation unit (104) is configured to actuate the first opener (1010) to release the moisturizer from the dispensing container (136); and

at least one actuating mechanism, upon activation configured to apply force on an external surface of the dispensing container (136) to release the predetermined amount of the moisturizer from the first opener (1010) to said one or more portions of the body through the at least one outlet port and at least one guiding channel (1016), wherein the at least one guiding channel (1016) has an inlet coupled to the at least one outlet port of the dispensing container (136) and an outlet disposed near to said one or more portions of the body, wherein the controller unit of the dispensation unit (104) is configured to activate the at least one actuating mechanism to release the moisturizer to said one or more portions of the body, wherein the at least one actuating mechanism comprises a first motor coupled to a first spindle (1120a) and a second spindle (1120b), through at least three interlocked gears, wherein the controller unit of the dispensation unit (104) is configured to:

actuate the first motor to cause a rotational movement of the first spindle (1120a) and the second spindle (1120b) over the external surface of the dispensing container (136), wherein rotation of first gear (1152) in an anti-clock wise direction causes rotational movement of a second gear (1154) and third gear (1156) in a clock-wise direction, wherein the first spindle (1120a) and the second spindle (1120b) mechanically attached to the second gear (1154) and the third gear (1156) respectively, rotate in the clockwise direction which causes a force on the dispensing container (136); and

release the moisturizer from the dispensing container (136) in accordance with the rotational movement of the first spindle (1120a) and the second spindle (1120b).

8. The dispensation unit as claimed in claim 7, wherein the controller unit of the dispensation unit (104) is further configured to:

release the moisturizer to the one or more portions of the body in accordance with a pre-defined time and frequency respectively set for the moisturizer release, wherein said time and frequency respectively are pre-defined based on at least one of: type of a skin of a user and an environmental condition.

9. The dispensation unit as claimed in claim 7, further comprising:

a flow control sensor (1110) to determine amount of the moisturizer released from the dispensing container (136); wherein the controller unit of the dispensation unit (104) is configured to monitor an output of the flow control sensor (1110) and compute quantity of the moisturizer already released from the dispensing container (136) and deactivate the at least one actuating mechanism to stop further release of the moisturizer from the

dispensing container (136), when the computed quantity of the moisturizer is equivalent to the predetermined amount of the moisturizer.

10. The dispensation unit as claimed in claim 7, wherein the controller unit of the dispensation unit (104) is configured to control speed and rotational direction of the first motor to control release of the moisturizer from the dispensing container (136).
11. The dispensation unit as claimed in claim 7, further comprising a plurality of dispensing containers, wherein an outlet port of each of the dispensing containers (136) is coupled to a respective inlet port of a connecting pipe (1014), wherein the connecting pipe includes at least one moisturizer releasing port coupled to a respective inlet port of the at least one guiding channel (1016).
12. The dispensation unit as claimed in claim 7, further comprising a housing adapted to be disposed on at least one item adapted to be worn by a user in a manner such that the outlet of the at least one guiding channel (1016) faces skin of the user.
13. The dispensation unit as claimed in claim 7, wherein the controller unit of the dispensation unit (104) is a central controller unit configured to communicatively couple to a plurality of controller units of a plurality of dispensation units respectively.
14. The dispensation unit as claimed in claim 13, wherein the central controller unit is configured to select the dispensing container (136) from the dispensing containers of the plurality of dispensation units to release the moisturizer to the one or more portions of the body.
15. The dispensation unit as claimed in claim 7, further comprising: a second opener (1012) coupled to the dispensing container, wherein an empty space between the first opener (1010) and the second opener (1012) acts as a reservoir of the moisturizer and a filled state of the empty space facilitates release of the moisturizer with a relatively higher pressure.
16. A system for dispensing moisturizer towards one or more portions of a body, the system comprising:
 - a smart wearable device (102) comprising:
 - a first controller (112) configured to determine nature, present condition of user's skin and quality of the user's skin through sensor data, wherein the sensor data is received from a plurality of sensor including a temperature sensor, conductance sensor, moisture sensor and ultraviolet radiation sensor;

a scheduler (118) configured to determine a release time for the moisturizer, a predetermined quantity of the moisturizer, and said one or more portions of the body to release the moisturizer thereof; and

the first controller unit (112) configured to communicate an instruction to release the moisturizer based on determination of the scheduler (118); and

a dispensation unit (104) comprises:

a second controller unit (132) configured to receive the instruction from the first controller unit (112) to release the predetermined amount of the moisturizer to said one or more portions of the body;

a dispensing container (136) comprises at least one outlet port to release the predetermined amount of the moisturizer thereof;

a first opener (1010) coupled to the at least one outlet port of the dispensing container (136), wherein the second controller unit is configured to actuate the first opener (1010) to release the moisturizer from the dispensing container (136); and

at least one actuating mechanism, upon activation, configured to apply force on an external surface of the dispensing container (136) to release the predetermined amount of the moisturizer from the first opener (1010) to the one or more portions of the body through at least one guiding channel (1016); wherein the at least one guiding channel has an inlet coupled to the at least one outlet port (1108) of the dispensing container (136) and an outlet disposed near the one or more portions of the body; wherein the second controller unit is configured to activate the at least one actuating mechanism to release the moisturizer to one or more portions of the body, wherein the at least one actuating mechanism comprises a first motor coupled to a first spindle (1120a) and a second spindle (1120b), through at least three interlocked gears, wherein the controller unit of the dispensation unit (104) is configured to:

actuate the first motor to cause a rotational movement of the first spindle (1120a) and the second spindle (1120b) over the external surface of the dispensing container (136), wherein rotation of first gear (1152) in an anti-clock wise direction causes rotational movement of a second gear (1154) and third gear (1156) in a clock-wise direction, wherein the first spindle (1120a) and the second spindle (1120b) mechanically attached to the second gear (1154) and the third gear (1156) respectively, rotate in the clockwise direction which causes a force on the dispensing container (136); and

release the moisturizer from the dispensing container (136) in accordance with the rotational movement of the first spindle (1120a) and the second spindle (1120b).

17. The system as claimed in claim 16, wherein the smart wearable device (102) comprises a sensor module (120) to monitor physical and physiological parameters of a user and environmental parameters of a location of the user.
18. The system as claimed in claim 17, further includes an application server (108) configured to process, store and retrieve user profile related information and environmental related information to determine requirement of releasing the moisturizer to the one or more portions the body.

ABSTARCT

METHOD AND SYSTEM FOR DISPENSING MOISTURIZER TOWARD ONE OR MORE PORTIONS OF A BODY

In an embodiment, the method for dispensing moisturizer to one or more portions of a body is disclosed. The method comprising determining various parameters and selecting at least one dispensation policy based on the various parameters. Subsequently, the moisturizer is released towards a desired portion of the body. In addition, an apparatus and system for dispensing the moisturizer is disclosed.

[FIGURE 1]