FORM 2

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COMPLETE SPECIFICATION
(See Section 10; rule 13)

BEVERAGE PREPARING AND DISPENSING DEVICE

APPLICANT(S)
NAME: JAIN (Deemed-to-be University)
NATIONALITY: Indian
ADDRESS: Jain Global Campus, Jakkasandra Post, Kanakapura Road, Kanakapura Taluk, Ramnagar District, Bangalore – 562112, Karnataka, India.

The following specification particularly describes the invention and the manner in which it is to be performed:

FIELD OF THE INVENTION

[0001] The present invention relates to a beverage preparing and dispensing device that is accessed by a user to prepare a customized beverage in accordance to health requirements, while suggesting suitable ingredient substitutions in real-time based on user's health data, thereby enabling preparation of a beverage that supports overall well-being.

BACKGROUND OF THE INVENTION

[0002] A beverage is a liquid intended for human consumption, commonly prepared for refreshment, nutritional supplementation, or therapeutic benefits. In today's fast-paced lifestyle, individuals often prefer ready-made beverages that are quick to prepare and personalized to taste. However, many commercially available beverages are generalized in composition and do not cater to individual health profiles or energy requirements. People with specific dietary restrictions or health conditions such as diabetes, high blood pressure, or fatigue may unknowingly consume ingredients that are incompatible with their health, potentially aggravating existing conditions.

[0003] Additionally, while preparing beverages manually at home, the process often involves multiple steps such as peeling, grinding, blending, and dispensing, which can be time-consuming and inconvenient for users with limited time or physical ability. Moreover, conventional beverage machines do not offer real-time suggestions based on the user's current health status, nor do they possess the intelligence to detect a user's physical or emotional condition such as signs of fatigue or low energy which may require tailored nutritional intervention.

[0004] Furthermore, traditional beverage preparation devices lack advanced automation features, resulting in limited interactivity, inefficient ingredient use, and inability to maintain freshness of stored ingredients. Users are required to

monitor ingredient levels manually, clean and hydrate perishable items, and often deal with inconsistent taste due to manual recipe handling. These inefficiencies contribute to user dissatisfaction and a lack of personalization in beverage consumption.

[0005] **EP0377195B1** discloses a method and device for the dispensing of drinks, particularly carbonated soft drink beverages. One or more filled containers, having an outlet opening and a deformable wall, are enclosed within a pressure vessel with a dispensing valve communicating with the containers. Pressurized fluid is introduced into the pressure vessel so that when the discharge valve is opened, the wall of the container is squeezed, thereby expelling its contents. The containers are normally family size, soft drink plastic bottles. The device is suitable for use in private homes, offices and commercial places.

[0006] **WO2021016331A1** discloses a means for adding flavoring and/or ingredients that are not water-soluble into a liquid is disclosed. A means for adding flavoring and/or ingredients that are not completely soluble into a water containing liquid such as a liquid containing alcohol and water (including distilled spirits such as whiskey, rum, gin and vodka as well as ready to drink mixtures thereof), is also disclosed. A means for generating a flavored and/or effervescent beverage with non-water-soluble ingredients using a refillable or replaceable cartridge and a refillable or replaceable container, is also disclosed.

[0007] Conventionally, there exists many devices that focuses on automating parts of the beverage preparation process, do not integrate health analytics, ingredient customization, and seamless user interaction. Additionally, these existing devices and systems also fail in assessing user-specific needs, process fresh ingredients in real-time, and deliver a health-optimized beverage with minimal user intervention.

[0008] In order to overcome the aforementioned drawbacks, there exists a need in

the art to develop a device that requires to analyze individual health data and physiological states, provide suitable ingredient recommendations, automate the entire preparation from raw ingredient to final beverage, and ensure freshness and hygiene, thereby enabling users to consume a beverage that is not only personalized in taste but also optimized for their well-being.

OBJECTS OF THE INVENTION

[0009] The principal object of the present invention is to overcome the disadvantages of the prior art.

[0010] An object of the present invention is to develop a device that is capable of customizing beverage recipes to align with the user's health preferences and dietary restrictions, helping users make informed and healthier consumption choices.

[0011] Another object of the present invention is to develop a device that is capable of automatically adjusting the ingredients based on user's physical state, such as fatigue, to promote increased alertness and vitality, enhancing the beverage's functional value.

[0012] Another object of the present invention is to develop a device that is capable of automating the entire preparation process, including cleaning, processing, and mixing of ingredients, reducing manual labor and saving time for the user.

[0013] Another object of the present invention is to develop a device that is capable of ensuring consistent results in taste, texture, and nutritional balance by storing and executing predefined recipes with precise ingredient quantities and processing techniques.

[0014] Another object of the present invention is to develop a device that is capable of allowing users to operate it easily and hygienically, even in hands-free situations or while multitasking.

[0015] Yet another object of the present invention is to develop a device that monitors ingredient levels and ensures that perishable items are kept fresh, notifying users when replenishment or cleaning is needed, thus maintaining hygiene and readiness.

[0016] The foregoing and other objects, features, and advantages of the present invention will become readily apparent upon further review of the following detailed description of the preferred embodiment as illustrated in the accompanying drawings.

SUMMARY OF THE INVENTION

[0017] The present invention relates to a beverage preparing and dispensing device that is accessed by a user to prepare a beverage customized to personal preferences and current physiological state. In addition, the device detects signs of fatigue in the user and selects suitable ingredients that promote alertness and energy, thereby enhancing the functional value of the beverage.

[0018] According to an embodiment of the present invention, a beverage preparing and dispensing device, comprising a housing constructed with a plurality of partitions, for storing ingredients in a segregated manner, a touch enabled display panel mounted on the housing to enable a user to input preferences relating to beverage and health details, an artificial intelligence-based imaging unit is installed on the housing and integrated with a processor for recording and processing images in a vicinity of the housing, to capture the user's face to determine exhaustion to accordingly select ingredients promoting energy and alertness in the user, a database is linked with a microcontroller containing a

plurality of recipes, a specific recipe is selected as per user preferences, health and determined exhaustion, a Peltier unit installed in each of the partitions for maintaining a temperature of the ingredients within a predefined temperature range, a heating element is provided within each of the partitions for heating of ingredients placed in the partitions, as per selected recipe**,** a peeling arrangement provided within the housing for removing peel of specific ingredients, the peeling arrangement comprises a plate configured with a vibration unit provided at an opening of the housing for feeding of ingredients, a conveyor belt disposed within the housing for receiving the ingredients, an L-shaped articulated telescopic link installed within housing and having a motorised roller with blades for removing peel from the ingredients and an air blower mounted within the housing for blowing away the peel, a compartment positioned in the housing, at an end of the conveyor belt for receiving the peeled ingredients and a motorised blade is installed in the compartment for grinding the ingredients.

[0019] According to another embodiment of the present invention, the device further includes a plurality of grooves are formed over the conveyor belt, in a grid pattern, for stabilising ingredients positioned on the belt, a robotic arm integrated in the housing manipulates the ingredients over the belt during peeling**,** a receptacle in the housing for receiving the ground ingredient, a pair of shafts is installed within the receptacle by means of hydraulic pushers, a mesh fabric looped around the shafts for squeezing an extract from the ground ingredients, to be transferred into one of the partitions, by means of a tube configured with a filter, for straining the extract, a drum is located within the housing, connected to the receptacle by a hose configured with an iris hole for receiving debris from squeezing**,** a blending chamber configured with a motorised mixing flap disposed within the housing, connected with the partitions via conduits, for receiving the ingredients and blending into a beverage, the conduits are configured with flow valves for dispensing the ingredients into the chamber in quantities, a nozzle attached in a notch carved in a lateral portion of the housing connected with the chamber by a pipe for dispensing the beverage, a slotted box attached with the

housing, adjacent to the notch, for storage of tumblers, for receiving the beverage, a suitable tumbler is pushed out of the slot by means of a pneumatic actuator provided in the slot, to be positioned underneath the nozzle, a multi-section storage mounted inside the notch, to dispense seasonings into the dispensed beverage via iris lids provided in the storage, a weight sensor is embedded in each of the partitions, to monitor a quantity of ingredient remaining in each of the partitions, a microphone and a speaker mounted on the housing to enable the user to operate the device via voice-based interaction and a sprayer installed in each of the partition, connected with a water tank in the housing for periodically hydrating ingredients prone to drying.

[0020] While the invention has been described and shown with particular reference to the preferred embodiment, it will be apparent that variations might be possible that would fall within the scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

Figure 1 illustrates an isometric view of a beverage preparing and dispensing device.

DETAILED DESCRIPTION OF THE INVENTION

[0022] The following description includes the preferred best mode of one embodiment of the present invention. It will be clear from this description of the invention that the invention is not limited to these illustrated embodiments but that the invention also includes a variety of modifications and embodiments thereto. Therefore, the present description should be seen as illustrative and not limiting. While the invention is susceptible to various modifications and alternative

constructions, it should be understood, that there is no intention to limit the invention to the specific form disclosed, but, on the contrary, the invention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention as defined in the claims.

[0023] In any embodiment described herein, the open-ended terms "comprising," "comprises," and the like (which are synonymous with "including," "having" and "characterized by") may be replaced by the respective partially closed phrases "consisting essentially of," consists essentially of," and the like or the respective closed phrases "consisting of," "consists of, the like.

[0024] As used herein, the singular forms "a," "an," and "the" designate both the singular and the plural, unless expressly stated to designate the singular only.

[0025] The present invention relates to a beverage preparing and dispensing device that is accessed by a user to prepare a beverage aligned with user-defined health and taste preferences. In addition, the device automatically processes fresh ingredients, monitors ingredient availability, and executes precise recipe instructions, while also selecting ingredients based on real-time physiological cues, thus ensuring the beverage is both beneficial and personalized, with minimal manual effort from the user.

[0026] Referring to Figure 1, an isometric view of a beverage preparing and dispensing device is illustrated, comprising a housing **101** constructed with a plurality of partitions **102**, a touch enabled display panel **103** mounted on the housing **101**, an artificial intelligence-based imaging unit **104** is installed on the housing **101**, a peeling arrangement **105** provided within the housing **101**, the peeling arrangement **105** comprises a plate **105a** configured with a vibration unit **105b** provided at an opening **106** of the housing **101**, a conveyor belt **105c** disposed within the housing **101**, an L-shaped articulated telescopic link **105d** installed within housing **101** and having a motorised roller **105e** with blades **105f**

and an air blower **105g** mounted within the housing **101**, a plurality of grooves **105h** are formed over the conveyor belt **105c**, in a grid pattern, a robotic arm **105i** integrated in the housing **101**, a compartment **107** positioned in the housing **101**, at an end of the conveyor belt **105c**, a motorised blade **108** is installed in the compartment **107**, a receptacle **109** in the housing **101**, a pair of shafts **110** is installed within the receptacle **109** by means of hydraulic pushers **111**, a mesh fabric **112** looped around the shafts **110**, by means of a tube configured with a filter, a drum **113** is located within the housing **101**, connected to the receptacle **109** by a hose **114** configured with an iris hole **115**.

[0027] Figure 1 further illustrates a blending chamber **116** configured with a motorised mixing flap **117** disposed within the housing **101**, connected with the partitions **102** via conduits **118**, the conduits **118** are configured with flow valves, a nozzle **119** attached in a notch **120** carved in a lateral portion of the housing **101** connected with the chamber by a pipe, a slotted box **121** attached with the housing **101**, adjacent to the notch **120**, a suitable tumbler is pushed out of the slot by means of a pneumatic actuator **122** provided in the slotted box **121**, a multi-section storage unit **123** mounted inside the notch **120** and having iris lids **124**, a microphone **128** and a speaker **125** mounted on the housing **101** and a sprayer **126** installed in each of the partition **102**, connected with a water tank **127** in the housing **101**.

[0028] The device disclosed herein comprises a housing **101**, which serves as a main structure of the device and is developed to be utilized by a user for preparing and dispensing beverages. The housing **101** is having multiple partitions **102** to store different ingredients in segregated manner. In an embodiment of the present invention, the user need to activate the device by simply pressing a push button, installed on the housing **101**.

[0029] The push button typically consists of a button cap which is the visible rounded part of the button that the user presses. When the user pushes the push

button, it pushes down a plunger, which is a small rod or a cylinder. Inside the push button, there are electrical contacts made of electrical materials like metal. When the user presses the push button, it completes the electrical circuit, allowing current to flow and triggering an inbuilt microcontroller's operation, associated with the device.

[0030] After activation of the device, the user need to provide input preferences regarding beverage and health details, over a touch enabled display panel **103**, installed on the housing **101**. The touch enabled display panel **103** as mentioned herein is typically an LCD (Liquid Crystal Display) screen that presents output in a visible form. The screen is equipped with touch-sensitive technology, allowing the user to interact directly with the display using their fingers. A touch controller IC (Integrated Circuit) is responsible for processing the analog signals generated when the user input preferences regarding beverage and health details. A touch controller is typically connected to the microcontroller through various interfaces which may include but are not limited to SPI (Serial Peripheral Interface) or I**2**C (Inter-Integrated Circuit).

[0031] Upon receiving input preferences from the user, the microcontroller suggest the user regarding preferred ingredients incompatible with user's health. Simultaneously, the microcontroller actuates an artificial intelligence-based imaging unit **104**, installed on the housing **101** to capture multiple images of the housing **101** in view of detecting exhaustion on user's face.

[0032] The artificial intelligence based imaging unit **104** is constructed with a camera lens and a processor, wherein the camera lens is adapted to capture a series of images of the user's face. The processor carries out a sequence of image processing operations including pre-processing, feature extraction, and classification by utilizing machine learning and artificial intelligence protocols. The image captured by the imaging unit **104** is real-time images of the user.

[0033] The artificial intelligence based imaging unit **104** transmits the captured image signal in the form of digital bits to the microcontroller. The microcontroller upon receiving the image signals compares the received image signal with the pre-fed data stored in a database and constantly determines exhaustion on user's face and accordingly selects ingredients promoting energy and alertness in the user. The database also contains multiple recipes and each recipe is selected, in accordance with the user preferences, health and determined exhaustion, which ensures that the beverage preparation is both personalized and responsive to the user's immediate needs.

[0034] Each partition **102** within the housing **101** is equipped with a heating element. These elements are individually controlled to heat the ingredients placed in their respective partitions **102** according to the requirements of the selected recipe. This precise temperature management ensures optimal flavour extraction and ingredient preparation. The heating element used herein is preferably a copper coil that generates heat when an electric current passes through the coil.

[0035] When an electric current runs through a copper wire the electrons come across the resistive forces of the medium's material, releasing energy that is expended in the form of heat energy. The copper coil is properly insulated to prevent any heat loss and also direct the generated heat toward the plastic flakes. The heating unit begins to generate heat and as the heating element warms up, the heating element heats the the ingredients placed in their respective partitions **102** according to the requirements of the selected recipe.

[0036] The device includes a peeling arrangement **105** for removing the peel of specific ingredients. The peeling arrangement **105** comprises a plate **105a** with a vibration unit **105b** at the housing's opening **106** for feeding ingredients, a conveyor belt **105c** with grid-patterned grooves **105h** for stabilizing ingredients, and an L-shaped articulated telescopic link **105d** with a motorized roller **105e** and blades **105f** for peeling. An air blower **105g** is used to blow away the removed

peel, and a robotic arm **105i** manipulates the ingredients over the belt during the peeling process. The peeling arrangement automates and streamlines the peeling process, improving efficiency and consistency.

[0037] The process begins at the housing's opening **106**, where ingredients are introduced onto the plate **105a**. The vibration unit **105b** gently agitates the ingredients, ensuring they are evenly distributed. Once on the plate **105a**, the ingredients are transferred onto the conveyor belt **105c** that features grid-patterned grooves **105h**. These grooves **105h** are critical for stabilizing the ingredients as they move along the belt, preventing them from rolling or shifting out of position. This stabilization is essential for precise and uniform peeling, as it allows the subsequent mechanical components to interact with each ingredient in a controlled manner.

[0038] As the ingredients progress along the conveyor, the L-shaped articulated telescopic link **105d** with the motorized roller **105e** and blades **105f** get activate for the actual peeling action. The telescopic link **105d** adjusts its position and reach by using pneumatic unit, accommodating ingredients of various sizes and shapes. The motorized roller **105e**, equipped with sharp blades **105f**, rotates and makes contact with the surface of the ingredients, efficiently removing the peel.

[0039] During the peeling process, the air blower **105g** is strategically positioned to blow away the detached peel, which not only keeps the workspace clean but also prevents the removed peel from interfering with the ongoing operation or contaminating the peeled ingredients. The air flow is calibrated to be strong enough to clear debris without disturbing the ingredients themselves.

[0040] Meanwhile, the robotic arm **105i** then manipulating the ingredients as they move along the conveyor belt **105c**. The arm repositions, rotates, or steady the ingredients to ensure all surfaces are adequately peeled, adapting to irregular

shapes or stubborn peels, thereby optimizing throughput and product quality.

[0041] At the end of the conveyor belt **105c**, a compartment **107** is positioned to receive the peeled ingredients. Inside this compartment **107**, a motorized blade **108** grinds the ingredients, preparing them for extraction, which ensures the ingredients are processed to the right consistency for subsequent extraction.

[0042] The motorized blade **108** is equipped with paddles that are capable of effectively grinding the ingredients, when in operation. These blade **108** is strategically positioned to create turbulence and ensure thorough grinding of the ingredients. The paddles of the motorized blades **108** is shaped and positioned to create a vortex within the compartment **107**. The motorized blade **108** is connected to a small and powerful electric motor that provides the necessary rotatory motion to the blades **108** to effectively grind the ingredients.

[0043] The ground ingredients are transferred into a receptacle **109** within the housing **101**. This receptacle **109** features a pair of shafts **110** installed by hydraulic pushers **111**, with a mesh fabric **112** looped around them for squeezing extract from the ground ingredients. The extracted liquid is transferred into one of the partitions **102** through a tube equipped with a filter for straining. A drum **113**, connected to the receptacle **109** by a hose **114** with an iris hole **115**, collects the debris from the squeezing process, ensuring efficient waste management.

[0044] A blending chamber **116**, equipped with a motorized mixing flap **117**, is located within the housing **101**. This chamber is connected to the ingredient partitions **102** via conduits **118** that have flow valves. The flow valves dispense ingredients into the chamber in precise quantities as dictated by the selected recipe. Inside the chamber, the mixing flap **117** blends the ingredients into a uniform beverage.

[0045] A nozzle **119** is attached in a notch **120** carved into a lateral portion of the housing **101**. This nozzle **119** is connected to the blending chamber **116** by a pipe and is responsible for dispensing the finished beverage. The placement and design of the nozzle **119** ensure convenient and hygienic delivery of the beverage into a tumbler. In an embodiment of the present invention, the nozzle **119** works by utilizing electrical energy to automize the flow solution in a controlled flow pattern by converting the pressure energy of a fluid into kinetic energy, which increases the fluid's velocity. Upon actuation of nozzle **119** by the microcontroller, the pump pressurizes the beverage, increasing its pressure significantly. High pressure enables the beverage to be dispensed out with a high force into the tumbler.

[0046] Adjacent to the nozzle **119**, a slotted box **121** is attached to the housing **101** for storing tumblers. When the beverage is ready, a suitable tumbler is automatically selected and pushed out of the slot by a pneumatic actuator **122**. The pneumatic actuator **122** utilizes compressed air to get extend and retract. The process begins with an air compressor which compresses atmospheric air to a higher pressure. The air cylinder of the pneumatic unit contains a piston that moves back and forth within the cylinder. The cylinder is connected to one end of the actuator **122**.

[0047] The piston is attached to the actuator **122** and its movement is controlled by the flow of compressed air. To extend the actuator **122** the piston activates the air valve to allow compressed air to flow into the chamber behind the piston. As the pressure increases in the chamber, the piston pushes the actuator **122** to the desired length. Then the tumbler is then positioned underneath the nozzle **119**, ready to receive the dispensed beverage.

[0048] Inside the notch **120**, a multi-section storage unit **123** is mounted for dispensing seasonings into the beverage. Each section is equipped with an iris lid that controls the release of seasonings, allowing for precise addition according to

the recipe or user preference. The iris lid is typically composed of a series of thin, overlapping blades or petals arranged in a circular or hexagonal pattern. The microcontroller sends signals to the motor of the iris lid to regulate the flow of seasonings from the storage unit **123**. The motor then rotates or moves the iris blades to open the iris lid to the desired position and as the iris lid opens to regulate the flow of seasonings from the storage unit **123**.

[0049] Each partition **102** is embedded with a weight sensor to monitor the quantity of ingredient remaining to track inventory in real time, alerting users when a refill is needed and ensuring uninterrupted operation. The weight sensor is typically a load cell or strain gauge sensor. The ingredient exerts a downward force to the weight sensor due to their weight. The weight sensor detects this force and converts it into an electrical signal, typically in the form of voltage variations. The raw electrical signal is weak and noisy. Therefore, it goes through signal conditioning circuitry to amplify, stabilize, and filter the signal. This conditioned signal is then sent to the microcontroller and the microcontroller continuously monitors the weight.

[0050] A Peltier unit is installed in each partition **102** to maintain the temperature of the stored ingredients within a predefined range. This thermoelectric cooling or heating ensures that ingredients remain fresh and at optimal conditions for beverage preparation. The Peltier unit is a thermoelectric cooler that uses the Peltier effect to transfer heat from one side of the unit to the other when an electrical current is passed. The Peltier unit consists of two semiconductor materials connected in a sandwich-like fashion.

[0051] These materials are typically made of bismuth telluride and one side of the Peltier unit is called the hot side and the other is the cold side. When a direct current is applied to the Peltier unit, electrodes within the semiconductor material start moving from one side to the other. The Peltier effect occurs as a result of electron movement. When electrons flow from the cold side to the hot side, they

carry heat with them. This leads to one side of the Peltier unit becoming colder, and the other side becoming hooter. This effect allows the Peltier unit to effectively transfer heat from one side to the other, creating a temperature gradient.

[0052] A microphone **128** and a speaker **125** are mounted on the housing **101**, enabling users to operate the device via voice commands. This hands-free interaction enhances accessibility and convenience, especially in busy or hygienically sensitive environments. The microphone **128** plays a crucial role by converting spoken words or commands into electrical signals which are then processed and analyzed to trigger specific actions.

[0053] When the user speaks or commands, their vocal cords vibrate, creating sound waves. These sound waves travel through the air as variations in air pressure. The microphone **128** mentioned herein is a transducer that converts these variations in air into electric signals. The analog electrical signal is converted into digital form which is done by an analog-to-digital converter (ADC). The digital signal is then subjected to various signal processing techniques to enhance voice quality and eliminate noise, thereby enabling users to operate the device via voice commands.

[0054] On the other hand, the speaker **125** is capable of producing clear and natural sound and is capable of adjusting its volume based on ambient noise levels. The speaker **125** consists of audio information, which is in the form of recorded voice, synthesized voice, or other sounds, generated or stored as digital data. This data is often in the form of an audio file. The digital audio data is sent to a digital-to-analog converter (DAC). The DAC converts the digital data into analog electrical signals. The analog signal is often weak and needs to be amplified. An amplifier boosts the strength to a level so that the speaker **125** drives it effectively. The amplified audio signal is then sent to the speaker **125**. The core of the speaker **125** is an electromagnet attached to a flexible cone. These

sound waves travel through the air as pressure waves and are picked by the user's ear.

[0055] Each partition **102** is equipped with a sprayer **126** connected to a water tank **127** within the housing **101**. These sprayers **126** periodically hydrate ingredients that are prone to drying, preserving their quality and ensuring they are always ready for use in beverage preparation.

[0056] The present invention works best in the following manner, when the user interacts with the touch enabled display panel **103** to input beverage preferences and health details. Based on these health details, the microcontroller suggests alternatives to ingredients incompatible with the user's condition. Simultaneously, the artificial intelligence-based imaging unit **104** captures the user's face to determine exhaustion, and accordingly selects ingredients that promote energy and alertness. Ingredients are stored in the housing **101** constructed with the plurality of partitions **102**, each potentially maintained at the optimal temperature using Peltier units or heating elements depending on the selected recipe. Ingredients requiring peeling are introduced through the opening **106** onto the plate **105a** configured with the vibration unit **105b**, from where they move onto the conveyor belt **105c** featuring the plurality of grooves **105h** in the grid pattern for stabilization. the robotic arm **105i** manipulates the ingredients while the L-shaped articulated telescopic link **105d** with the motorized roller **105e** with blades **105f** peels them. Peels are then removed via the air blower **105g**. Peeled ingredients reach the compartment **107** positioned in the housing **101**, at the end of the conveyor belt **105c**, where the motorized blade **108** grinds them.

[0057] In continuation, the ground material is transferred into the receptacle **109**, where the pair of shafts **110** driven by hydraulic pushers **111** and wrapped in mesh fabric **112** squeeze out the extract. The extract is sent through the tube configured with the filter into one of the partitions **102**. From the partitions **102**, ingredients flow into the blending chamber **116** configured with the motorized mixing flap

117 via conduits **118** fitted with flow valves, which control the quantity as per the selected recipe. The final blended beverage is dispensed through the nozzle **119** attached in the notch **120** carved in the lateral portion of the housing **101**, with the slotted box **121** beside it housing **101** tumblers. the pneumatic actuator **122** selects and positions the appropriate tumbler under the nozzle **119**. Finally, the multi-section unit **123** mounted inside the notch **120** dispenses seasonings through iris lids **124** into the beverage. the weight sensor in each partition **102** monitors remaining ingredients, and the sprayer **126** connected to the water tank **127** keeps ingredients hydrated. the drum **113** connected to the receptacle **109** collects debris through the hose **114** configured with the iris hole **115**. Additionally, the microphone **128** and speaker **125** allow voice-based operation of the device.

[0058] Although the field of the invention has been described herein with limited reference to specific embodiments, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiments, as well as alternate embodiments of the invention, will become apparent to persons skilled in the art upon reference to the description of the invention.

We Claim:

1) A beverage preparing and dispensing device, comprising:

i) a housing **101** constructed with a plurality of partitions **102**, for storing ingredients in a segregated manner;

ii) a touch enabled display panel **103** mounted on said housing **101** to enable a user to input preferences relating to beverage and health details, wherein based on said health details said user is suggested alternatives to preferred ingredients incompatible with user's health;

iii) an artificial intelligence-based imaging unit **104** is installed on said housing **101** and integrated with a processor for recording and processing images in a vicinity of said housing **101**, to capture said user's face to determine exhaustion to accordingly select ingredients promoting energy and alertness in said user;

iv) a peeling arrangement **105** provided within said housing **101** for removing peel of specific ingredients;

v) a compartment **107** positioned in said housing **101**, at an end of said conveyor belt **105c** for receiving said peeled ingredients, wherein a motorised blade **108** is installed in said compartment **107** for grinding said ingredients;

vi) a receptacle **109** in said housing **101** for receiving said ground ingredient, wherein a pair of shafts **110** is installed within said receptacle **109** by means of hydraulic pushers **111**, a mesh fabric **112** looped around said shafts **110** for squeezing an extract from said ground ingredients, to be transferred into one of said partitions **102**, by means of a tube configured with a filter, for straining said extract;

vii) a blending chamber **116** configured with a motorised mixing flap **117** disposed within said housing **101**, connected with said partitions **102** via conduits **118**, for receiving said ingredients and blending into a beverage, wherein said conduits **118** are configured with flow valves for dispensing

said ingredients into said chamber in quantities in accordance with selected recipe;

viii) a nozzle **119** attached in a notch **120** carved in a lateral portion of said housing **101** connected with said chamber by a pipe for dispensing said beverage;

ix) a slotted box **121** attached with said housing **101**, adjacent to said notch **120**, for storage of tumblers, for receiving said beverage, wherein in accordance with beverage prepared, a suitable tumbler is pushed out of said slot by means of a pneumatic actuator **122** provided in said slot, to be positioned underneath said nozzle **119**; and

x) a multi-section storage unit **123** mounted inside said notch **120**, to dispense seasonings into said dispensed beverage via iris lids **124** provided in said storage unit **123**.

2) The device as claimed in claim 1, wherein a database is linked with said microcontroller containing a plurality of recipes, wherein a specific recipe is selected as per user preferences, health and determined exhaustion.

3) The device as claimed in claim 1, wherein a Peltier unit installed in each of said partitions **102** for maintaining a temperature of said ingredients within a predefined temperature range.

4) The device as claimed in claim 1, wherein a heating element is provided within each of said partitions **102** for heating of ingredients placed in said partitions **102**, as per selected recipe.

5) The device as claimed in claim 1, wherein said peeling arrangement **105** comprises a plate **105a** configured with a vibration unit **105b** provided at an opening **106** of said housing **101** for feeding of ingredients, a conveyor belt **105c** disposed within said housing **101** for receiving said ingredients, an L-shaped articulated telescopic link **105d** installed within housing **101** and

having a motorised roller **105e** with blades **105f** for removing peel from said ingredients and an air blower **105g** mounted within said housing **101** for blowing away said peel.

6) The device as claimed in claim 1, wherein a plurality of grooves **105h** are formed over said conveyor belt **105c**, in a grid pattern, for stabilising ingredients positioned on said belt, wherein a robotic arm **105i** integrated in said housing **101** manipulates said ingredients over said belt during peeling.

7) The device as claimed in claim 1, wherein a weight sensor is embedded in each of said partitions **102**, to monitor a quantity of ingredient remaining in each of said partitions **102**.

8) The device as claimed in claim 1, wherein a drum **113** is located within said housing **101**, connected to said receptacle **109** by a hose **114** configured with an iris hole **115** for receiving debris from squeezing.

9) The device as claimed in claim 1, wherein a microphone **128** and a speaker **125** mounted on said housing **101** to enable said user to operate said device via voice-based interaction.

10) The device as claimed in claim 1, wherein a sprayer **126** installed in each of said partition **102**, connected with a water tank **127** in said housing **101** for periodically hydrating ingredients prone to drying.

K. Setiya

Kunal Setiya

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Agent for the Applicant(s)

ABSTRACT

BEVERAGE PREPARING AND DISPENSING DEVICE

A beverage preparing and dispensing device, comprising a housing **101** constructed with partitions **102**, for storing ingredients, a touch enabled display panel **103** to enable user to input preferences relating to beverage and health details, an artificial intelligence-based imaging unit **104** to determine exhaustion, a compartment **107** for receiving peeled ingredients, motorized blade **108** for grinding ingredients, a receptacle **109**, receiving ground ingredient, a pair of shafts **110** via hydraulic pushers **111**, mesh fabric **112** for squeezing an extract from ground ingredients, to be transferred into one of partitions **102**, via tube, for straining extract, a blending chamber **116** with mixing flap **117**, for receiving ingredients and blending into beverage, a nozzle **119** for dispensing beverage, a slotted box **121**, store tumblers for receiving beverage, tumbler, pushed out of slot via pneumatic actuator **122**, to be positioned underneath nozzle **119**, multi-section storage unit **123** to dispense seasonings into dispensed beverage.

Ref. Figure 1