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**KRISHNAN**

(54) **PROCESS OF MAKING CEREAL, PULSE AND LENTIL ADMIXTURE**

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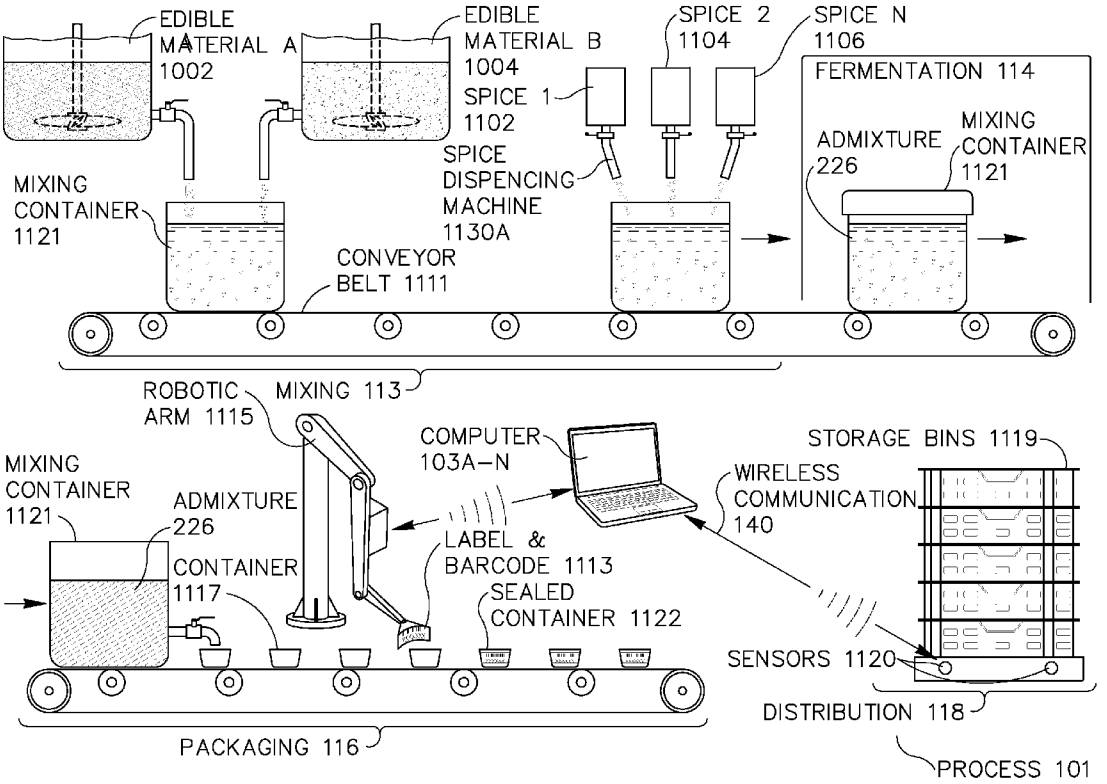
(57) **ABSTRACT**

A process and a method for automatically and/or semi automatically making a cereal and a pulse batter having an optimal consistency is described. The method and process also includes the steps for dispensing and storage for distribution. The cereal and pulse are soaked, ground and mixed together, spices added and allowed to ferment at an ambient temperature for an adequate time. The batter is packaged and stored in such a way that the batter's shelf life is increased. Expiration date is labeled on the container so that it can be monitored by the user. The process also provides a sterile way of preparing the various combinations of cereal and pulse as a batter. The optimal fermentation provides consistent delivery of taste. Packaging techniques provide appropriate shipping conditions.



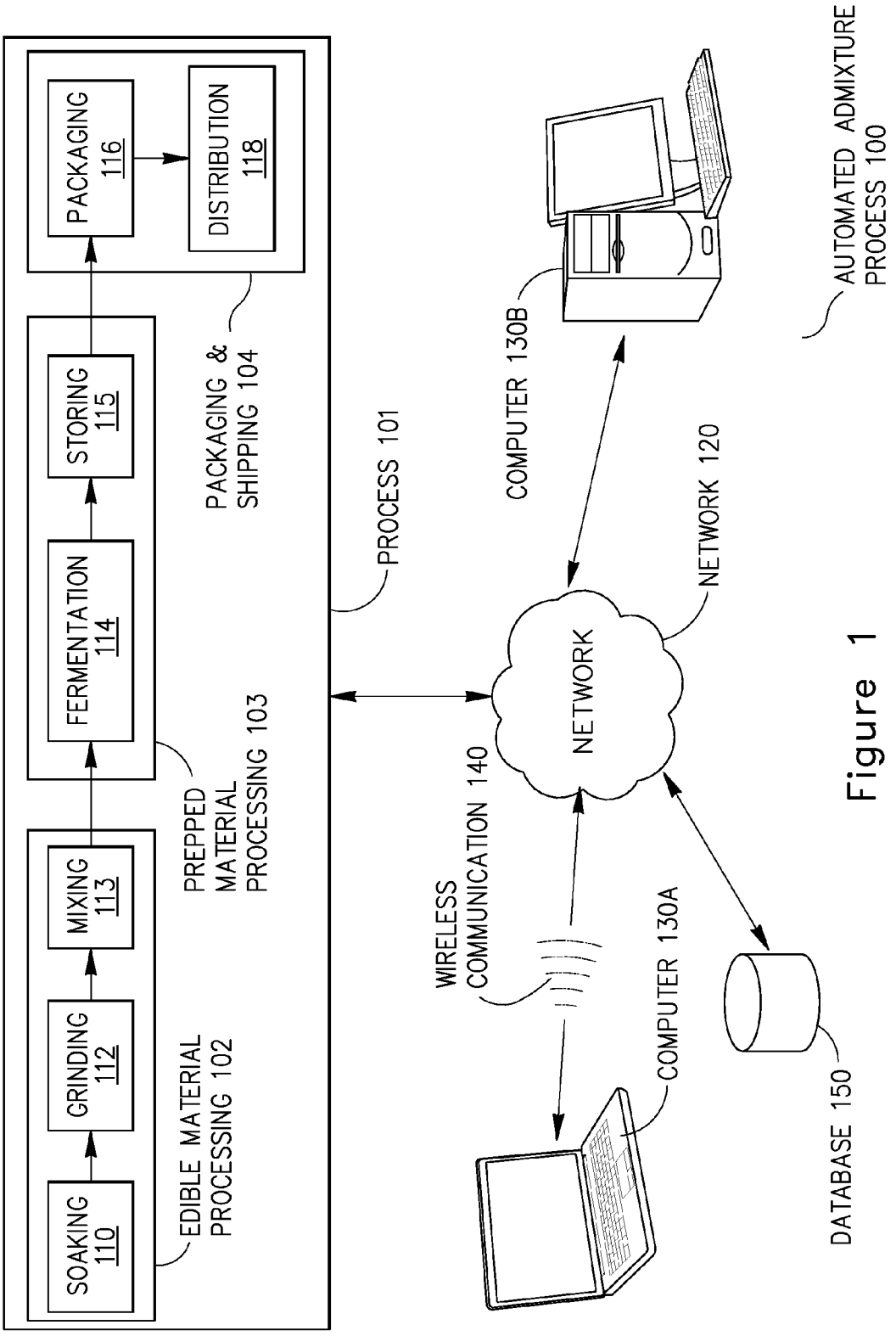

SOAKING 110
GRINDING 112
MIXING 113
FERMENTATION 114
STORING 115
PACKAGING 116
DISTRIBUTION 118
EDIBLE MATERIAL PROCESSING 102
PREPPED MATERIAL PROCESSING 103
PACKAGING & SHIPPING 104
PROCESS 101
NETWORK
NETWORK 120
COMPUTER 130B
COMPUTER 130A
WIRELESS COMMUNICATION 140
DATABASE 150
AUTOMATED ADMIXTURE PROCESS 100

Figure 1

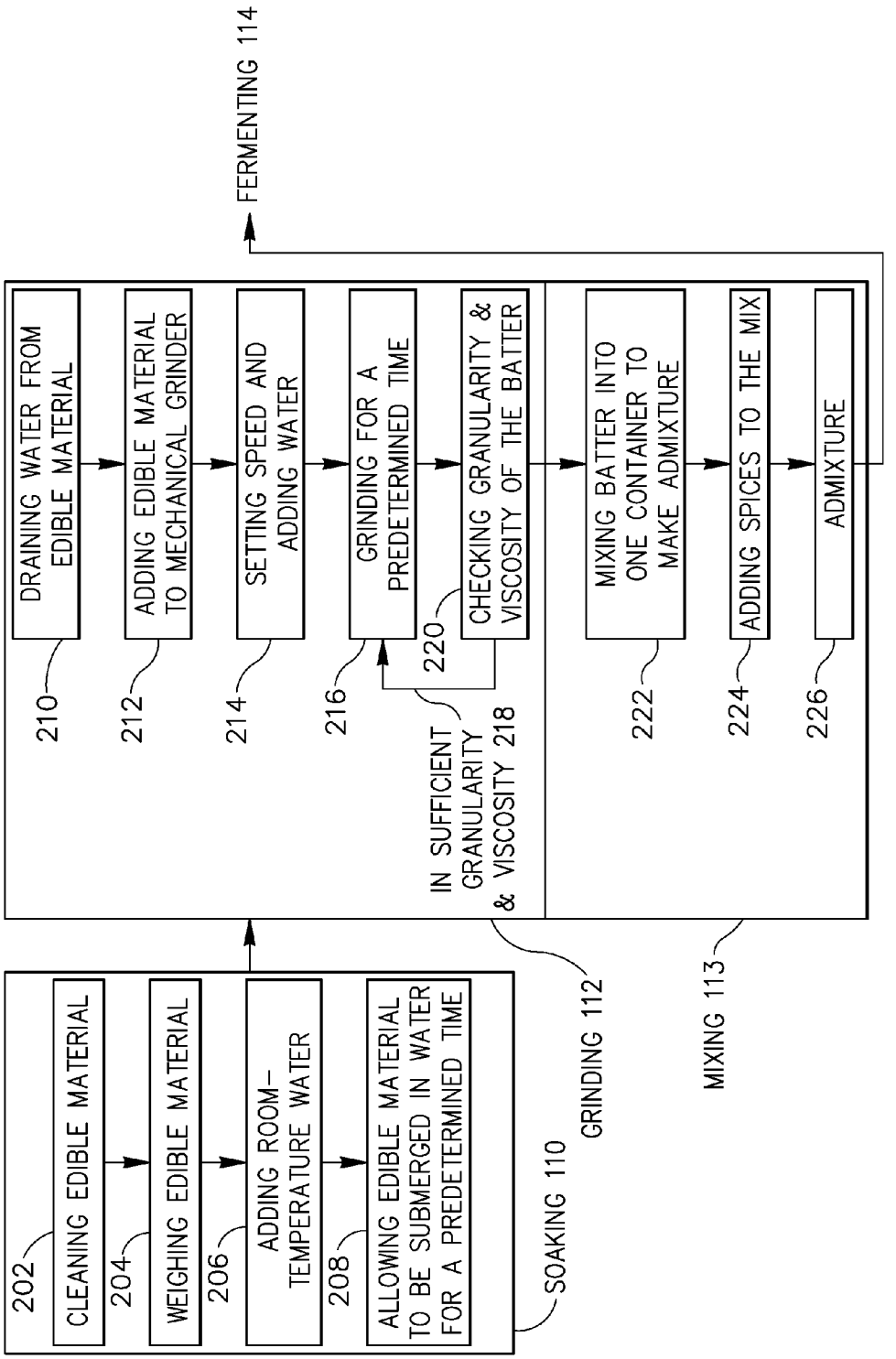

FERMENTING 114
EDIBLE MATERIAL PROCESSING 102
202
CLEANING EDIBLE MATERIAL
204
WEIGHING EDIBLE MATERIAL
206
ADDING ROOM-TEMPERATURE WATER
208
ALLOWING EDIBLE MATERIAL TO BE SUBMERGED IN WATER FOR A PREDETERMINED TIME
SOAKING 110
210
DRAINING WATER FROM EDIBLE MATERIAL
212
ADDING EDIBLE MATERIAL TO MECHANICAL GRINDER
214
SETTING SPEED AND ADDING WATER
216
GRINDING FOR A PREDETERMINED TIME
220
CHECKING GRANULARITY & VISCOSITY OF THE BATTER
IN SUFFICIENT GRANULARITY & VISCOSITY 218
GRINDING 112
222
MIXING BATTER INTO ONE CONTAINER TO MAKE ADMIXTURE
224
ADDING SPICES TO THE MIX
226
ADMIXTURE
MIXING 113

Figure 2

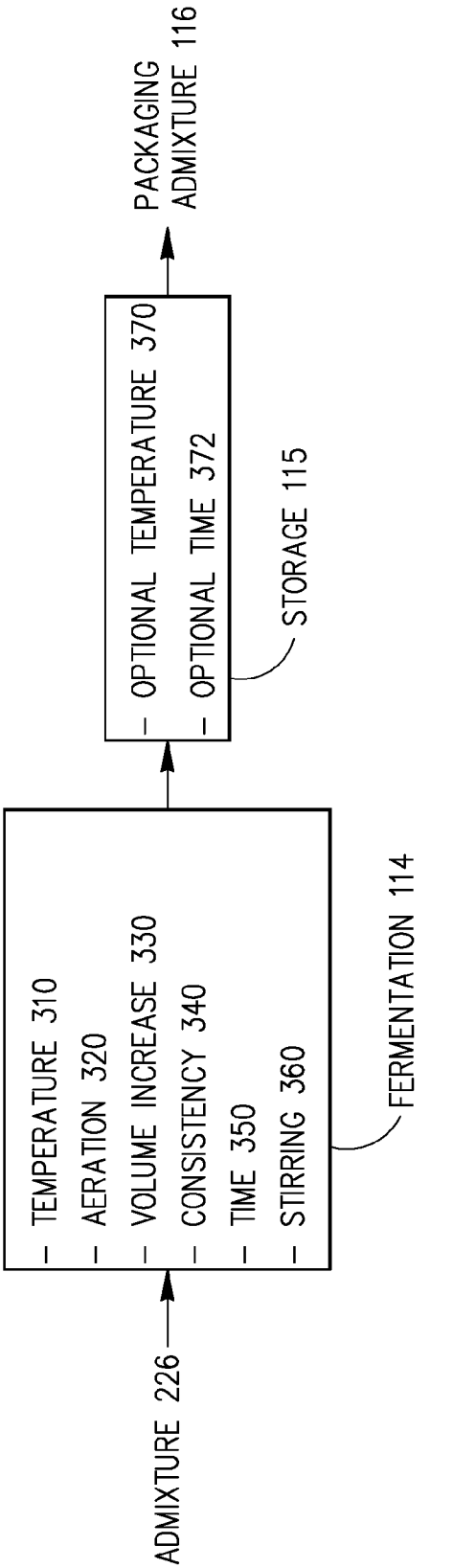

ADMIXTURE 226
TEMPERATURE 310
AERATION 320
VOLUME INCREASE 330
CONSISTENCY 340
TIME 350
STIRRING 360
FERMENTATION 114
OPTIONAL TEMPERATURE 370
OPTIONAL TIME 372
STORAGE 115
PACKAGING ADMIXTURE 116
PREPPED MATERIAL PROCESSING 103

Figure 3

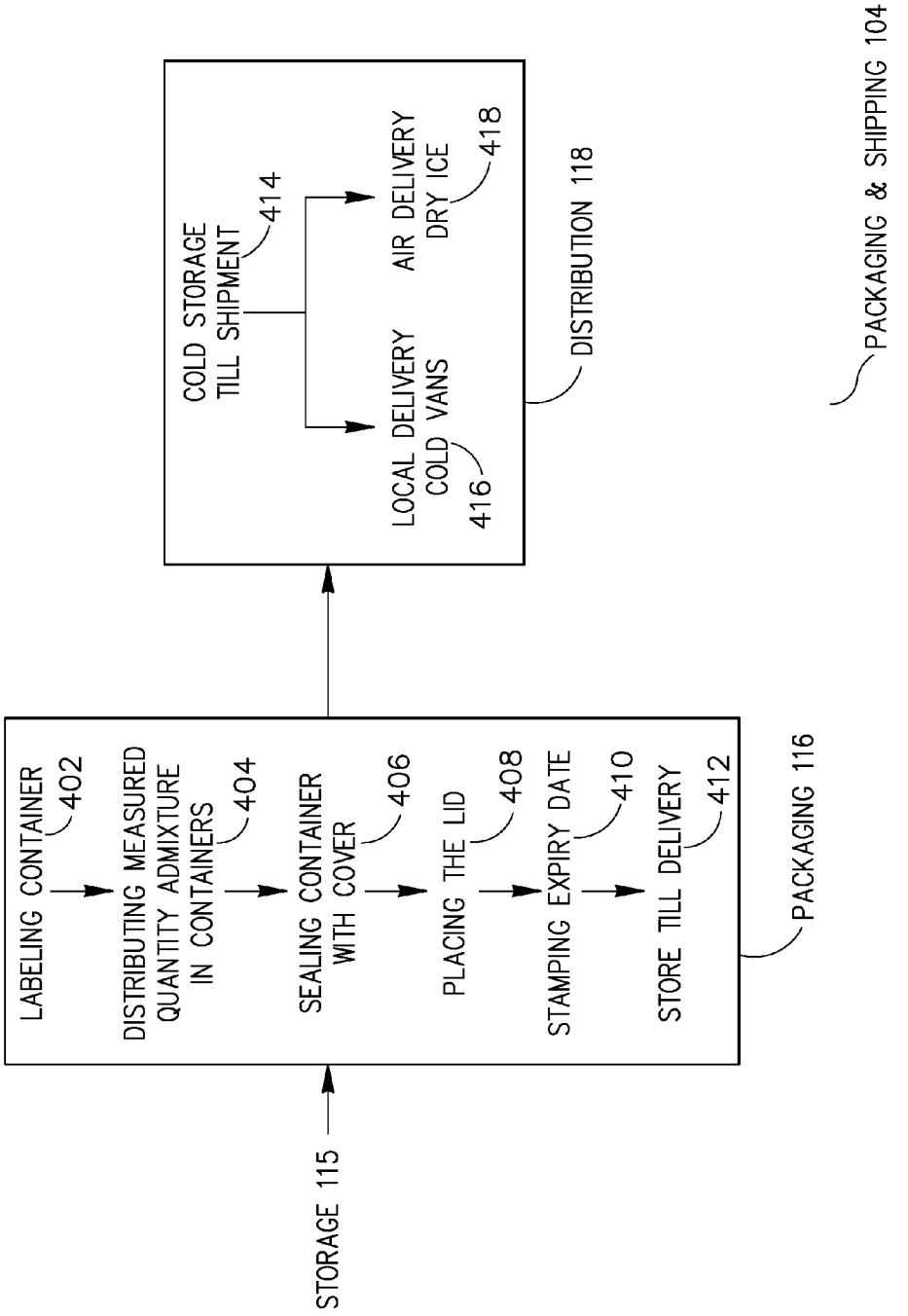

STORAGE 115
LABELING CONTAINER
402
DISTRIBUTING MEASURED QUANTITY ADMIXTURE IN CONTAINERS
404
SEALING CONTAINER WITH COVER
406
PLACING THE LID
408
STAMPING EXPIRY DATE
410
STORE TILL DELIVERY
412
PACKAGING 116
COLD STORAGE TILL SHIPMENT
414
LOCAL DELIVERY COLD VANS
416
AIR DELIVERY DRY ICE
418
DISTRIBUTION 118
PACKAGING & SHIPPING 104

Figure 4

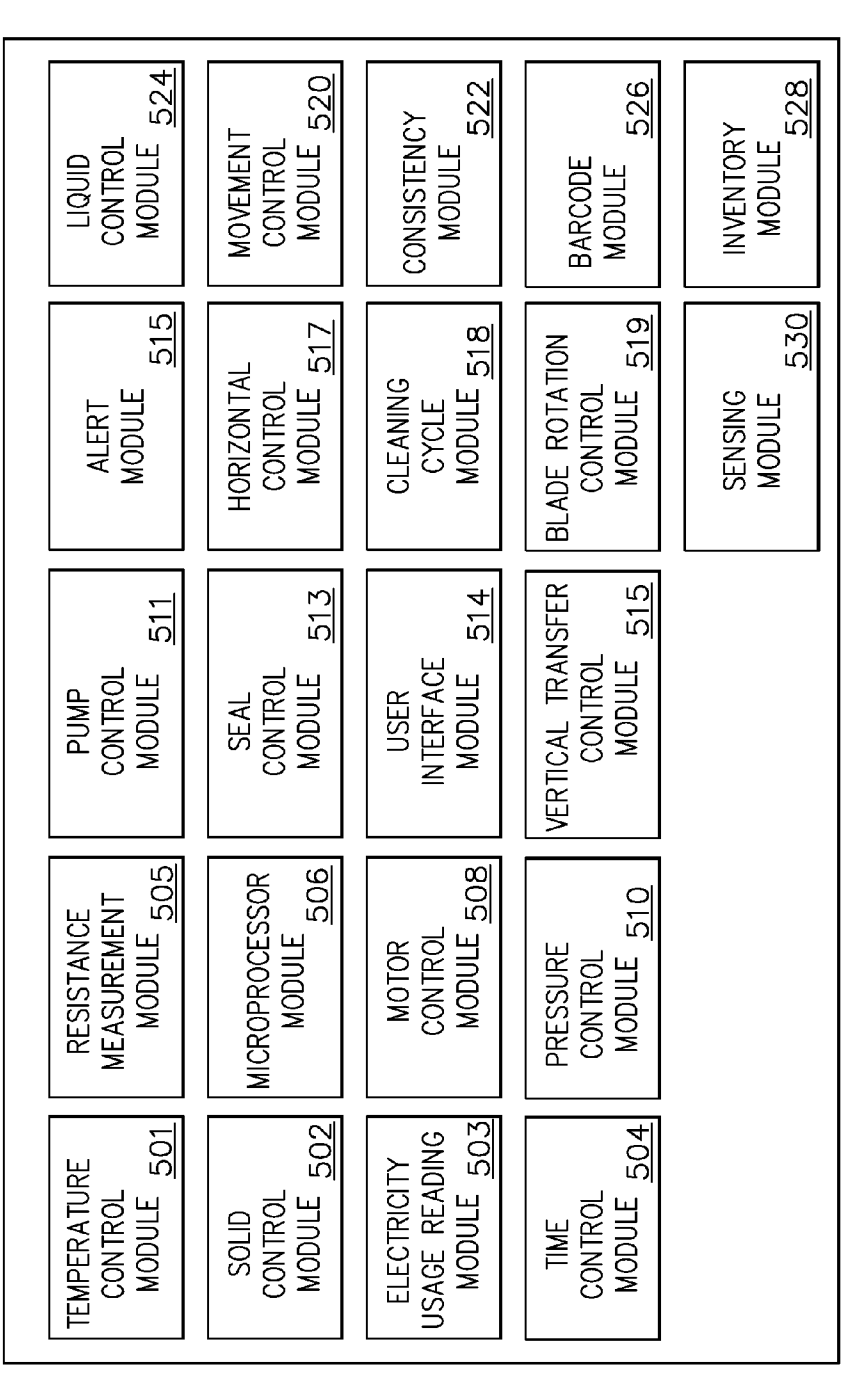

TEMPERATURE CONTROL MODULE 501
RESISTANCE MEASUREMENT MODULE 505
PUMP CONTROL MODULE 511
ALERT MODULE 515
LIQUID CONTROL MODULE 524
SOLID CONTROL MODULE 502
MICROPROCESSOR MODULE 506
SEAL CONTROL MODULE 513
HORIZONTAL CONTROL MODULE 517
MOVEMENT CONTROL MODULE 520
ELECTRICITY USAGE READING MODULE 503
MOTOR CONTROL MODULE 508
USER INTERFACE MODULE 514
CLEANING CYCLE MODULE 518
CONSISTENCY MODULE 522
TIME CONTROL MODULE 504
PRESSURE CONTROL MODULE 510
VERTICAL TRANSFER CONTROL MODULE 515
BLADE ROTATION CONTROL MODULE 519
BARCODE MODULE 526
SENSING MODULE 530
INVENTORY MODULE 528
AUTOMATION MODULE 500

Figure 5

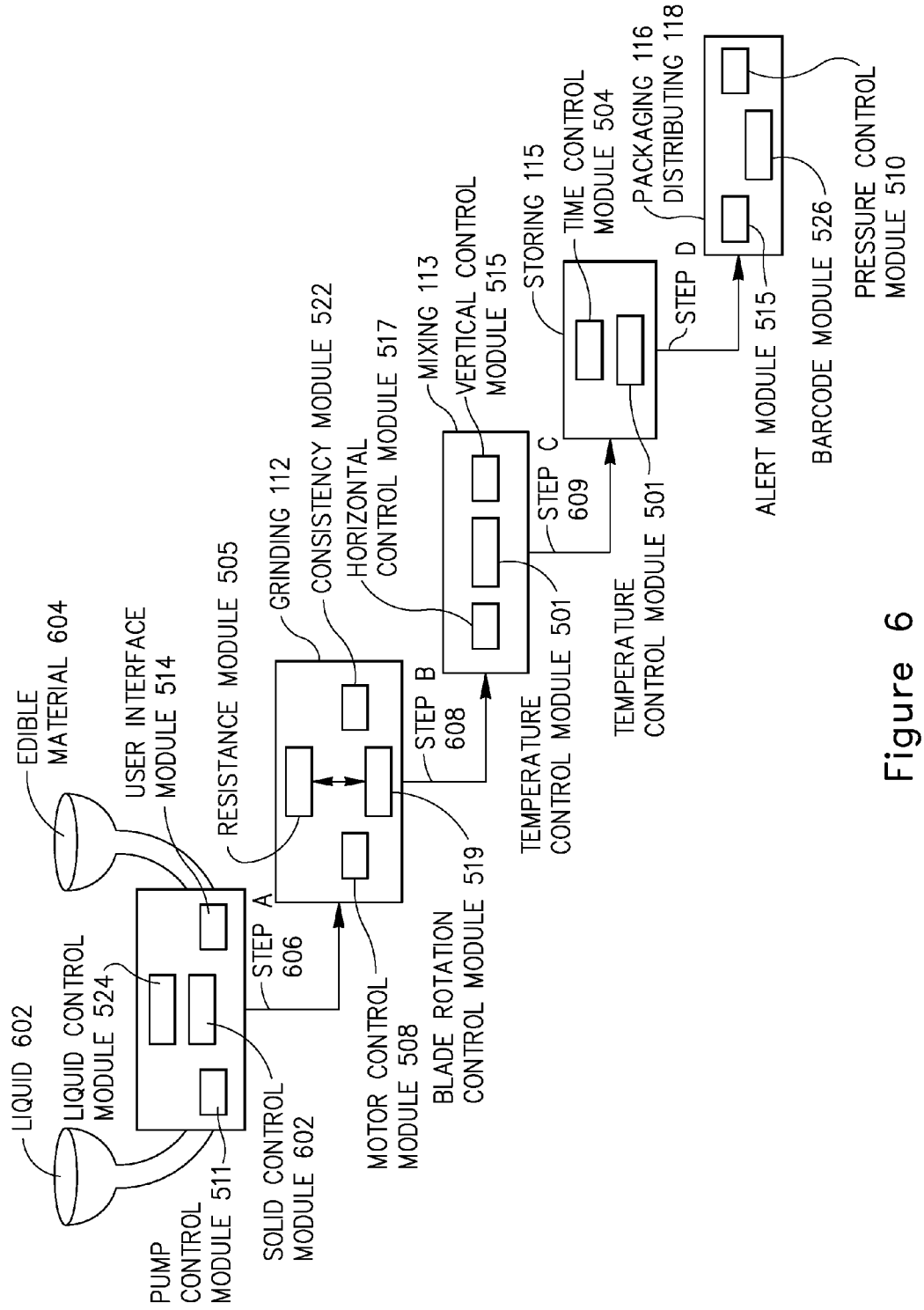

LIQUID 602
LIQUID CONTROL MODULE 524
PUMP CONTROL MODULE 511
EDIBLE MATERIAL 604
USER INTERFACE MODULE 514
RESISTANCE MODULE 505
SOLID CONTROL MODULE 602
STEP A 606
GRINDING 112
CONSISTENCY MODULE 522
MOTOR CONTROL MODULE 508
HORIZONTAL CONTROL MODULE 517
BLADE ROTATION CONTROL MODULE 519
STEP B 608
MIXING 113
VERTICAL CONTROL MODULE 515
TEMPERATURE CONTROL MODULE 501
STEP C 609
STORING 115
TIME CONTROL MODULE 504
STEP D
PACKAGING 116
DISTRIBUTING 118
ALERT MODULE 515
BARCODE MODULE 526
PRESSURE CONTROL MODULE 510

Figure 6

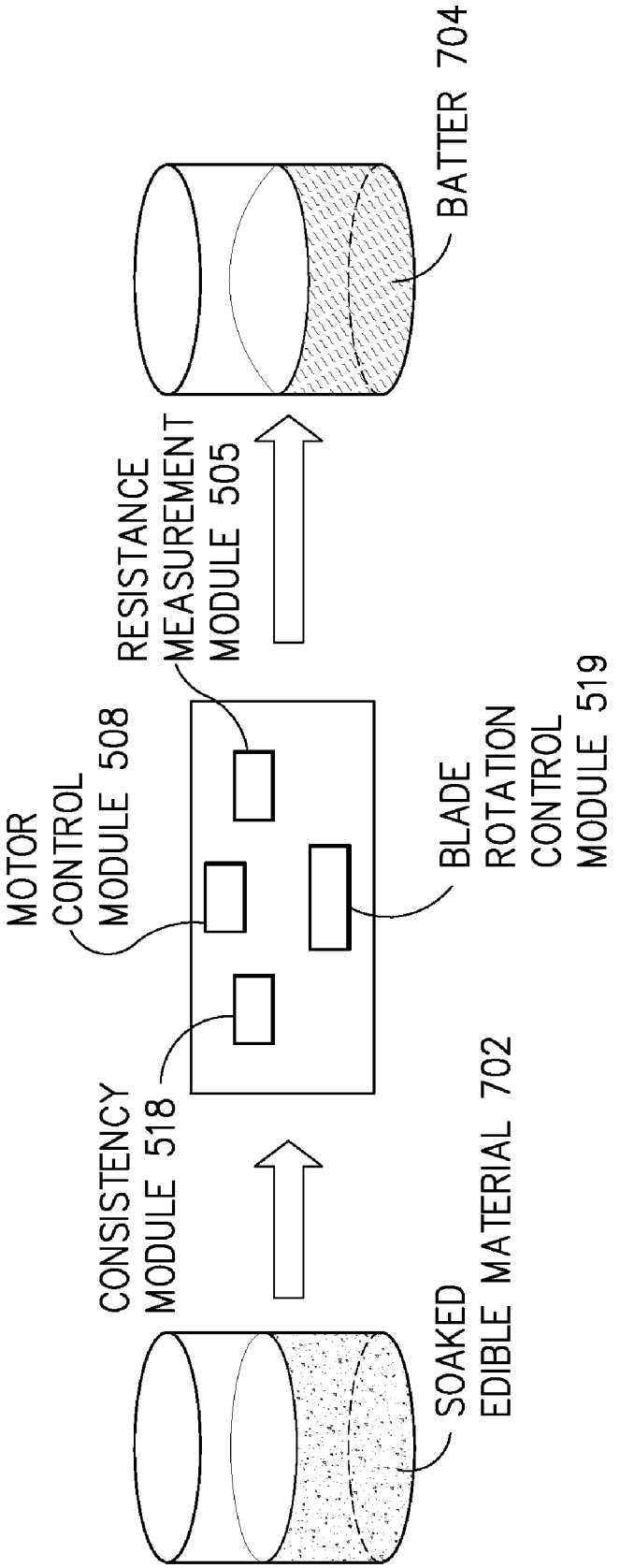

BATTER 704
RESISTANCE MEASUREMENT MODULE 505
MOTOR CONTROL MODULE 508
BLADE ROTATION CONTROL MODULE 519
CONSISTENCY MODULE 518
SOAKED EDIBLE MATERIAL 702
GRINDING 112

Figure 7

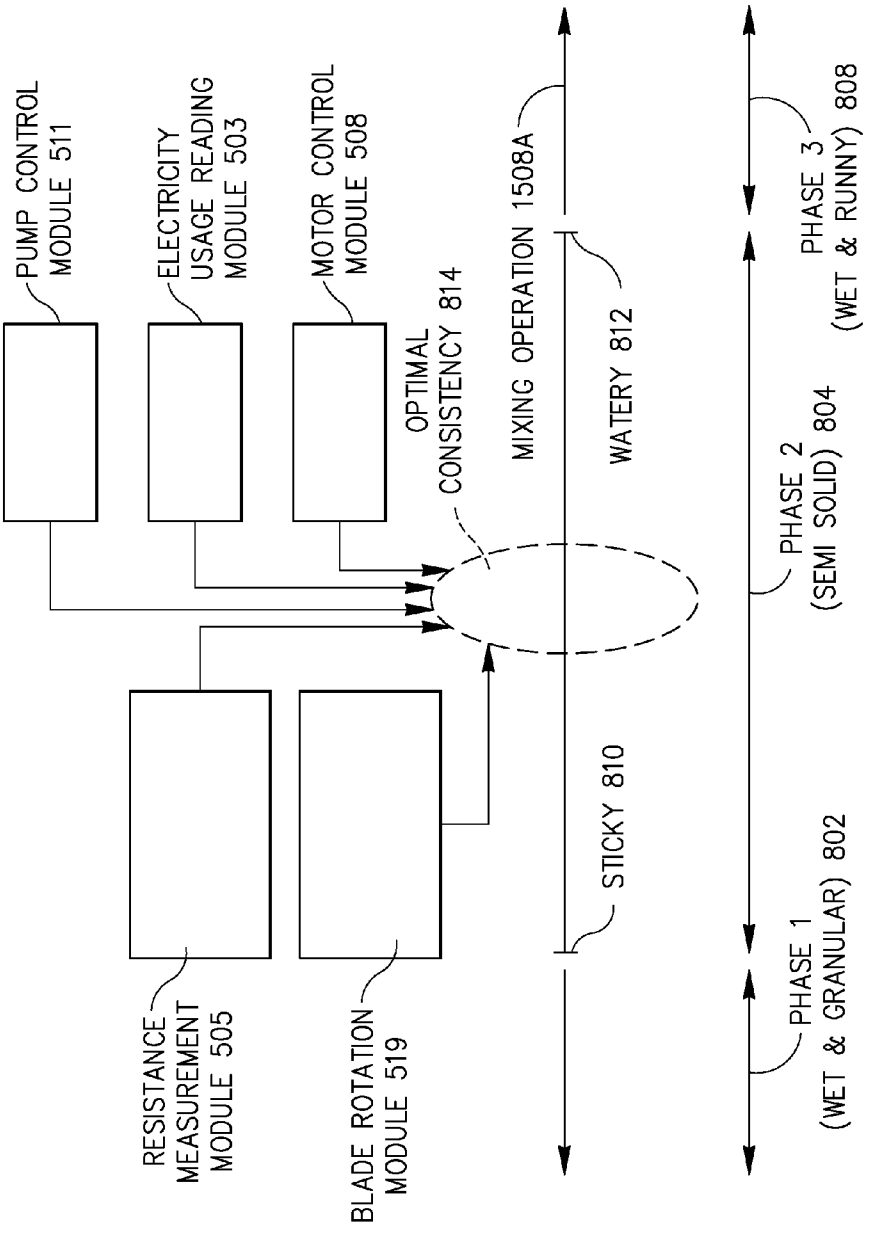

PUMP CONTROL MODULE 511
ELECTRICITY USAGE READING MODULE 503
MOTOR CONTROL MODULE 508
OPTIMAL CONSISTENCY 814
MIXING OPERATION 1508A
WATERY 812
STICKY 810
RESISTANCE MEASUREMENT MODULE 505
BLADE ROTATION MODULE 519
PHASE 1 (WET & GRANULAR) 802
PHASE 2 (SEMI SOLID) 804
PHASE 3 (WET & RUNNY) 808

Figure 8

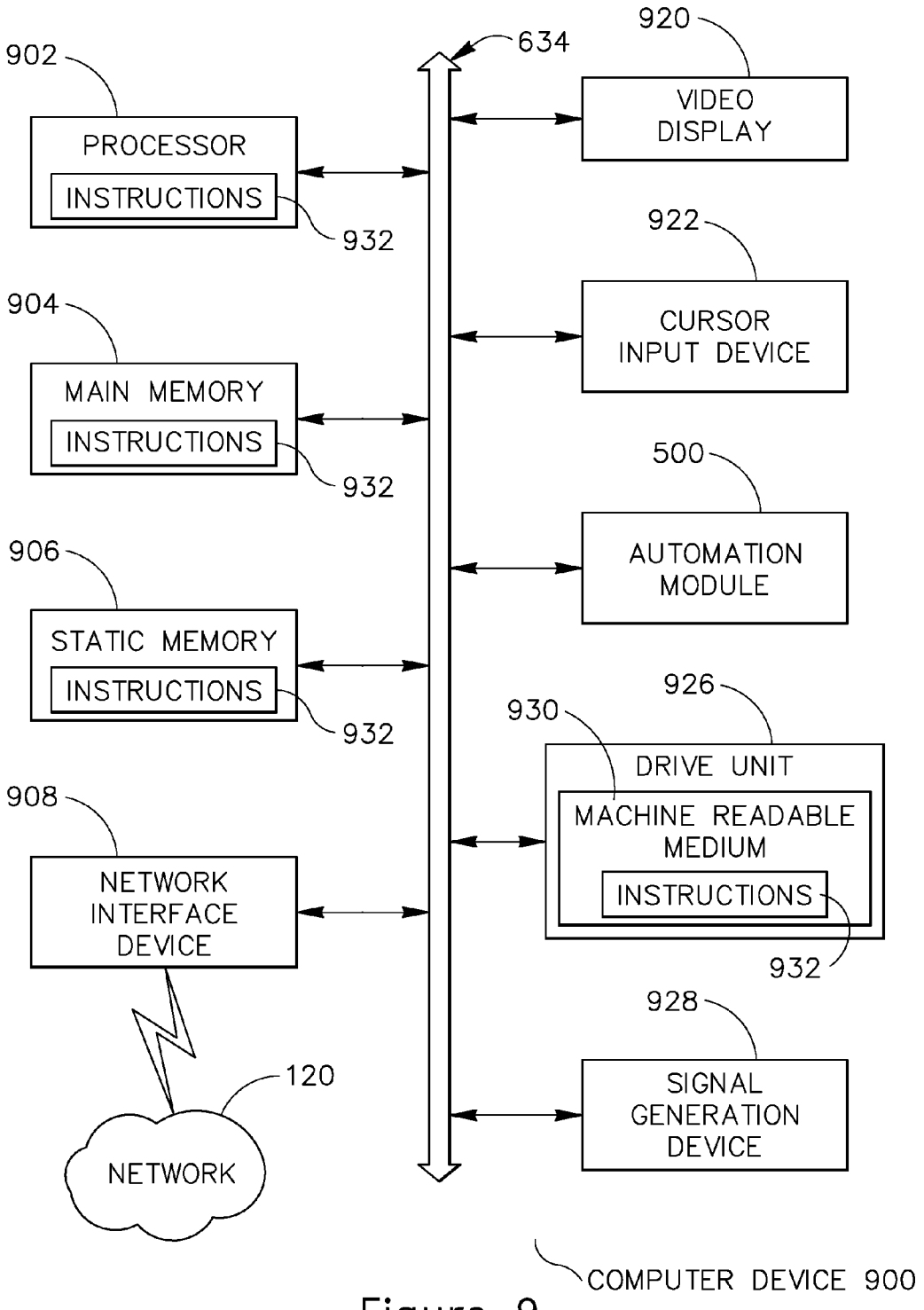

902
PROCESSOR
INSTRUCTIONS
932
904
MAIN MEMORY
INSTRUCTIONS
932
906
STATIC MEMORY
INSTRUCTIONS
932
908
NETWORK INTERFACE DEVICE
120
NETWORK
634
920
VIDEO DISPLAY
922
CURSOR INPUT DEVICE
500
AUTOMATION MODULE
926
930
DRIVE UNIT
MACHINE READABLE MEDIUM
INSTRUCTIONS
932
928
SIGNAL GENERATION DEVICE
COMPUTER DEVICE 900

Figure 9

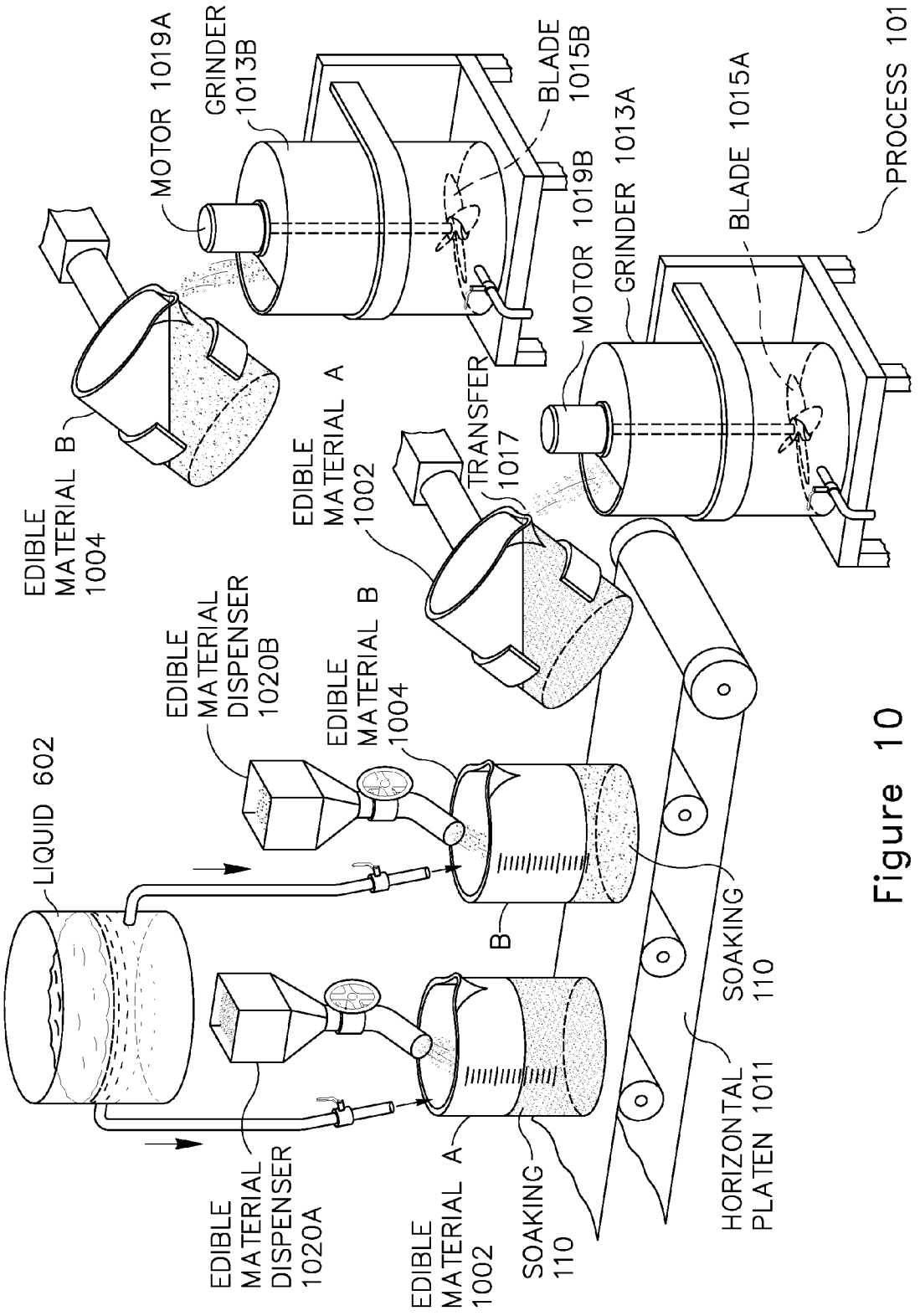

MOTOR 1019A
GRINDER 1013B
BLADE 1015B
PROCESS 101
BLADE 1015A
GRINDER 1013A
MOTOR 1019B
EDIBLE MATERIAL B 1004
EDIBLE MATERIAL A 1002
TRANSFER 1017
EDIBLE MATERIAL DISPENSER 1020B
EDIBLE MATERIAL B 1004
LIQUID 602
B
SOAKING 110
HORIZONTAL PLATEN 1011
EDIBLE MATERIAL DISPENSER 1020A
EDIBLE MATERIAL A 1002
SOAKING 110

Figure 10

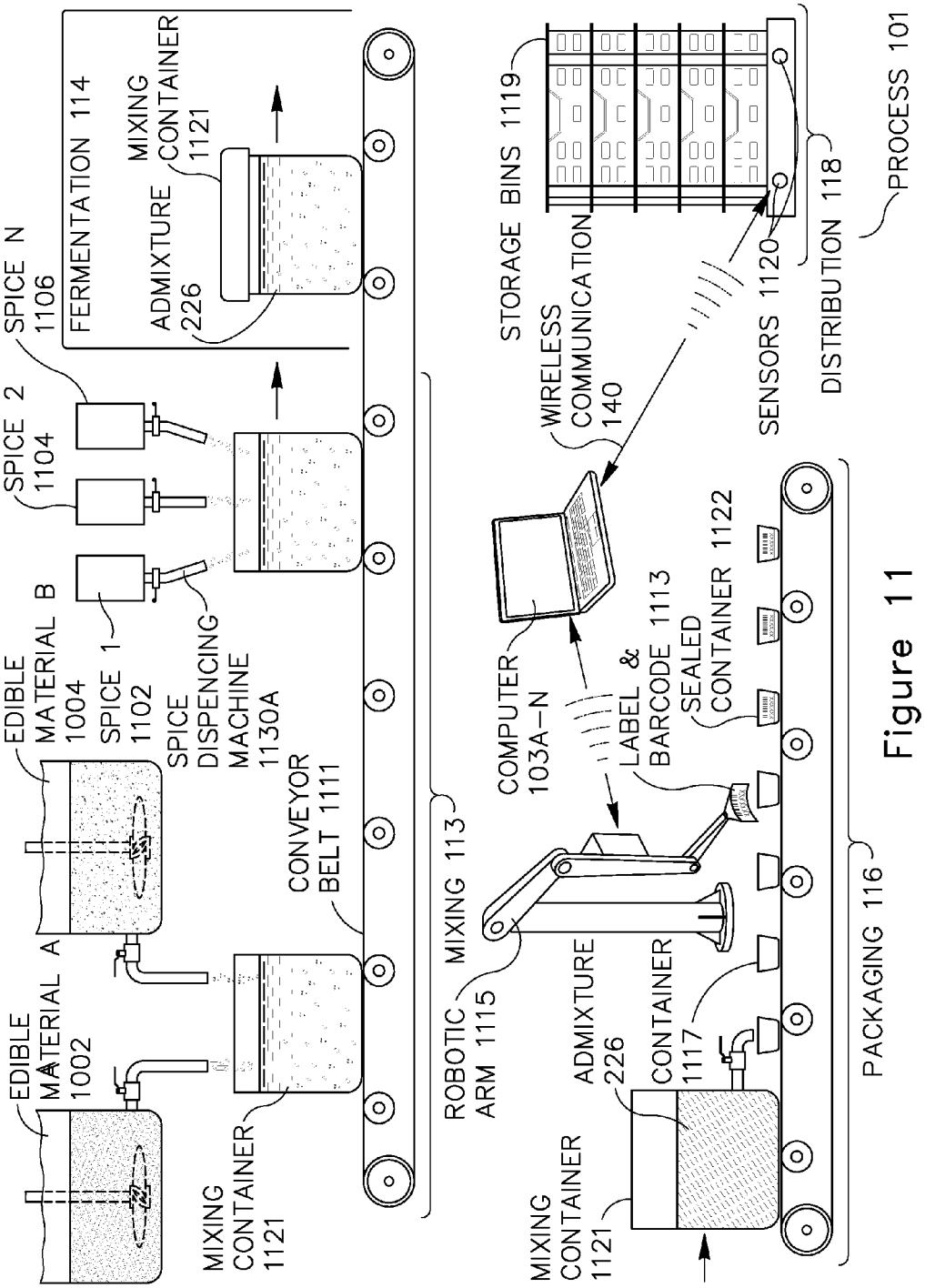

EDIBLE MATERIAL A 1002
EDIBLE MATERIAL B 1004
SPICE 1 1102
SPICE 2 1104
SPICE N 1106
SPICE DISPENCING MACHINE 1130A
CONVEYOR BELT 1111
MIXING CONTAINER 1121
FERMENTATION 114
ADMIXTURE 226
MIXING CONTAINER 1121
ROBOTIC ARM 1115
MIXING 113
COMPUTER 103A–N
WIRELESS COMMUNICATION 140
STORAGE BINS 1119
SENSORS 1120
DISTRIBUTION 118
PROCESS 101
LABEL & BARCODE 1113
SEALED CONTAINER 1122
ADMIXTURE 226
CONTAINER 1117
MIXING CONTAINER 1121
PACKAGING 116

Figure 11

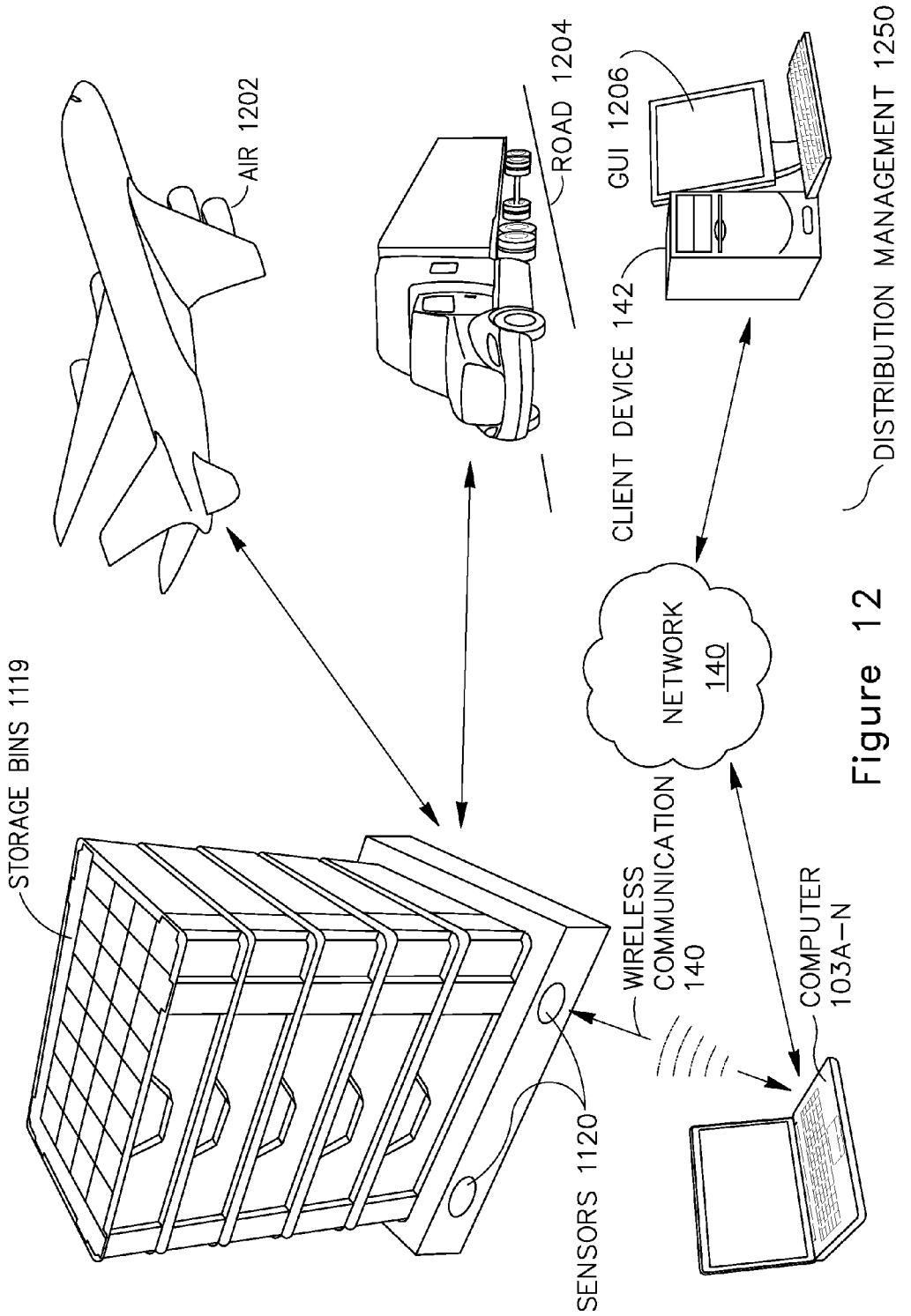

AIR 1202
ROAD 1204
GUI 1206
CLIENT DEVICE 142
DISTRIBUTION MANAGEMENT 1250
NETWORK 140
STORAGE BINS 1119
WIRELESS COMMUNICATION 140
COMPUTER 103A-N
SENSORS 1120

Figure 12

# PROCESS OF MAKING CEREAL, PULSE AND LENTIL ADMIXTURE

## FIELD OF TECHNOLOGY

**[0001]** This disclosure relates generally to a method and a process to make an admixture, using a cereal batter, a pulse and a lentil batter in a specific proportion, having an optimal consistency for efficient processing to a product.

## BACKGROUND

**[0002]** Cereal and lentil batter is used in producing pancake like edibles and steamed cake edibles in Southern India. Custom production of combination of different cereal and lentil are done to produce a batter that can be used for at least three or four days. The vagaries of temperature fluctuation, grinding duration, differences in types of cereal and lentil variety create a challenge to produce uniform batter. In the summer heat the fermentation process is very quick and it leads to sourness of the batter and pungent tasting batter. In colder months there is insufficient fermentation and leads to flat batter with no taste.

**[0003]** The consistency of the batter also varies from batch to batch. There are no means to maintain uniform consistency of the batter. Uniform consistency of the batter would enable the supplier to produce predictable batter quality batch after batch and allow the end user to use the batter without modification. The nutritional values may be stabilized and optimal per unit consumption may be predicted for the user.

**[0004]** Furthermore, the apparatus is currently available in the market to make cereal and lentil batter. They are bulky and rotate at a constant speed. The users have to monitor the consistency and then remove the batter to mix them together. In addition, some batter making apparatus require manual tilting during its operation, adding to the complexity for bulk production. The method is laborious and time consuming. Furthermore, the apparatus size used for higher quantity renders the apparatus to be disparate, bulky for use and difficult to clean and transfer one batter and mix it with another batter to make an admixture.

## SUMMARY

**[0005]** The invention discloses a method, a process and an apparatus for making admixture using at least two ingredients in combination of batters such as a cereal and a lentil, a cereal and a cereal, and a lentil and a lentil.

**[0006]** In one embodiment, a semi-automated method of making the admixture is disclosed. Network controlled raw material processing, prepared material processing and packaging and shipping are performed.

**[0007]** In one embodiment, optimal proportion of raw materials such as a cereal and a lentil to be used are shown. In another embodiment, automatic optimal grinding speed, time and batter consistency measurement is described.

**[0008]** In another embodiment, optimal soaking conditions for cereal and lentil are shown. Once the soaking period is over it may be transferred to grinding station for individually grinding till optimal consistency is achieved. In another embodiment, once the optimal consistency is reached for cereal batter and lentil batter are combined and appropriate spices are added.

**[0009]** In another embodiment, the consistency measurement is exceeding the given time one may monitor the raise in temperature for the batter and cooling procedure may be adopted to prevent premature fermentation of the cereal and lentil admixture.

**[0010]** In another embodiment, the spiced mixed batter is fermented at a constant temperature and the end point is measured by ascertaining the batter level raise. Once the fermentation is completed, the batter is stirred to remove the excess air, stored in the cold chamber till they are ready to be packed. In another embodiment, packing is done using labeled containers and a little hole is made on the sealing material to let any further gas build up during transportation.

**[0011]** In one embodiment, the apparatus may be configured to dispense ingredients, soak the ingredients, mix the ingredients, ferment the mixture based on the input obtained from internal monitoring sensors and/or inputs given by the user. The apparatus may be capable of processing either a single component at a time or simultaneously processing one component while other is being processed. The apparatus may not require continuous monitoring by the user as the apparatus is configured to generate alert for the user if intervention is required.

**[0012]** The apparatus in one embodiment may be controlled by a computer. In another embodiment, sensors may be used to measure several parameters such as temperature, consistency of the admixture, pressure and weight. In another embodiment, several modules may be used using the computer to control the entire assembly process including but not limited to dispensing, weighing, movement of the container from one location to another and consistency control module.

**[0013]** The methods, systems, and apparatuses disclosed herein may be implemented in any means for achieving various aspects, and may be executed in a form of a machine-readable medium embodying a set of instructions. Other features will be apparent from the accompanying drawings and from the detailed description that follows.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0014]** Example embodiments are illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

**[0015]** FIG. **1** is a system view illustrating generation of an automated admixture process according to one embodiment.

**[0016]** FIG. **2** is a flow chart illustrating an edible material processing according to one embodiment.

**[0017]** FIG. **3** is a flow chart illustrating a prepped material processing, according to one embodiment.

**[0018]** FIG. **4** is a flow chart illustrating a packaging and shipping processes, according to one embodiment.

**[0019]** FIG. **5** illustrates an automation module **500** implemented the manufacturing unit as illustrated in FIG. **1**, according to one embodiment.

**[0020]** FIG. **6** is a flow diagram illustrating a generation of admixture, according to one embodiment.

**[0021]** FIG. **7** is a perspective view illustrating a grinding process **112** according to one embodiment.

**[0022]** FIG. **8** illustrates various phases of preparing the admixture, according to one embodiment.

**[0023]** FIG. **9** is a diagrammatic system view **900** of a data processing system in which any of the embodiments disclosed herein may be performed, according to one embodiment.

**[0024]** FIG. **10** is a process **101** illustrating soaking and grinding operation **112** according to one embodiment.

**[0025]** FIG. **11** is a continuation of the process **101** illustrating additional operations according to one embodiment.

**[0026]** FIG. **12** illustrates a distribution management **1250**, according to one embodiment.

**[0027]** Other features of the present embodiments will be apparent from the accompanying drawings and from the detailed description that follows.

## DETAILED DESCRIPTION

**[0028]** Example embodiments, as described below, may be used to provide a method and a process to make an admixture, using a cereal batter and a lentil batter in a specific proportion, having an optimal consistency for efficient processing to a product. Although the present embodiments have been described with reference to specific example embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the various embodiments.

**[0029]** FIG. **1** is a system view illustrating generation of an automated admixture process **100** according to one embodiment. Particularly, the automated admixture process **100** includes process **101**, computer **130**A-B, network **120** and wireless communication **140**. Process **101** in turn comprises of edible material processing **102**, prepped material processing **103**, packaging and shipping **104** according to one embodiment. The automated admixture process **100** is completely controlled through a computing device such as a computer or a programmable logic controller device. The automated admixture process may be controlled through automation software designed thereof for generating an admixture. The automated admixture process may be semi automated and a few steps may be performed manually. The computing devices that controls the automated admixture process **100** may be located in proximity with the manufacturing unit or in at a remote location.

**[0030]** The computing devices such as a computer **130**A and/or the computer **130**B may be the computing devices for implementing an automated admixture process **100** according to one example embodiment. The manufacturing unit may be coupled to the computing device (e.g., the computer **130**A and the computer **130**B) through a network **120**. The network **120** may be a wired network or a wireless network. The computing devices may be coupled to the network through the wired communication or through wireless communication **140**. The manufacturing unit includes edible material processing unit, the prepped material processing unit and packaging and shipping unit. The edible material processing unit may include equipments required for processing the edible material. The edible material processing **102** may include a soaking process **110**, grinding process **112** and the mixing process **113** according to one embodiment. A database **150** may be used for storing all the information such as weights, names, quantities and inventory. The edible material processing **102** is further explained in FIG. **2**.

**[0031]** The prepped material processing unit includes specific equipments for preparing a final product. The prepped material processing **103** may include fermentation process **114**, storing process **115** according to one embodiment. The prepped material processing **103** is explained in FIG. **3**. The packaging and shipping unit may include packaging unit and distribution unit performing a packaging process **116** and a distribution process **118**. The packaging and shipping **104** processes in explained in FIG. **4**.

**[0032]** FIG. **2** is a flow chart illustrating an edible material processing **102** according to one embodiment. The soaking process **110** includes steps as described below. In step **202**, edible materials for preparing a batter may be cleaned. For example, the edible materials may be cleaned by washing the edible materials in water repeatedly. In addition, the standard procedures including removal of minute earthly materials or contaminants such as small stones may be performed to render the edible materials ready for preparation of batter. In step **204**, each of the edible materials may be weighed separately. Each of the weighed edible materials may be places in separate containers. In one embodiment, the edible material may include, but not limited to cereal, lentil, pulses, beans and the like. Cereal may be rice, wheat, semolina, barley, maize, oats, rye, sorghum, quinoa, amaranth, varieties of rice such as parboiled rice, wild rice, brown rice etc. Pulses may be black gram, red gram, mung bean, chickpea, bengal gram etc. In step **206**, an appropriate amount of room temperature water based on weight and type of the edible material may be added. For example, the water requirement for soaking rice may be more than the volume of water required for soaking lentil. In step **208**, each of the edible materials may be allowed to be submerged in water for a predetermined duration of time (30 minutes to 3 hours) in separate containers. After soaking the edible material for a predetermined duration of time the grinding process **112** may be initiated. Prior to the grinding process the soaked edible material may be cleaned using a contaminant removal machine to remove the unclean water and other solid contaminants present in the water layer.

**[0033]** In one embodiment, the grinding **112** process is as described below. In step **210**, the liquid (water) used for soaking the edible materials may be drained. In step **212**, the edible material may be added to a mechanical grinder. In step **214**, an appropriate volume of water based on weight and type of soaked edible material may be added into the mechanical grinder. In one embodiment, each of the edible material may be added into a separate grinder for grinding operation. In addition, each of the grinders may be set for grinding process. In step **216**, the edible materials may be grinded for a predetermined time in the mechanical grinder to generate a batter of an optimal viscosity and granularity. In step **220** the grinder may be stopped and viscosity and granularity of the batter may be checked. The batter for first edible ingredient such as a cereal and the second edible ingredient such a pulse or a lentil or combination of both may be in the ratio of 2:1, 3:1 or 4:2:2. Many permutation and combination of cereal and pulses and/or lentils may done. Spices may be at least one of salt, chili, coriander, black pepper, fenugreek seed or powder and not limited to only these examples. One such example may be 100 grams (gms) of Rice, 50 grams of Black gram dhal, 5 mgms of salt, and 5 mgms of black pepper, 1 mgm of fenugreek seed or powder. In one embodiment, if the viscosity of the batter and the granularity is below a threshold then the step **216** is performed for additional amount of time. Insufficient granularity and viscosity **218** leads back to step **216** of grinding for a predetermined time. Once grinding process **112** is completed, the mixing process **113** is initiated. In one embodiment, the mixing process **113** is described in step **222**. The generated batter may be mixed into one container to generate an admixture **226**. Further, in step **224** the grounded spices may be added into the admixture. In the admixture **226**, the batters are thoroughly mixed to ensure an optimal mixture for consumption. Once the admixture is gen-

erated, the admixture may be further processed in prepped material processing **103** step such as fermenting **114** as described in FIG. **3**.

**[0034]** FIG. **3** is a flow chart illustrating a prepped material processing **103** according to one embodiment. The admixture **226** may be placed in a container. The container may be placed in a closed environment for fermentation. The fermentation process **114** includes providing an optimal temperature **310** usually between 45°-70° C. more specifically 55°-60° C., aeration **320** for a specific duration of time **350**, to increase the volume of admixture **330** with an optimal consistency **340**. The admixture may be stirred **360** at periodic intervals or at an appropriate time during fermentation. Keeping the admixture **226** for a specific duration of time in a closed environment may generate an admixture that is fermented. Once the fermented admixture is generated the fermented admixture is sent for packing. In a specific embodiment, if the admixture is not sufficiently fermented, the admixture is stored for an additional duration at an optimal temperature for generating the fermented admixture. The fermented admixture is sent for packaging and shipping **104**.

**[0035]** FIG. **4** is a flow chart illustrating a packaging and shipping processes **104** according to one embodiment. The fermented admixture is sent to storage **115** in the packaging unit. In step **402**, containers for storing the fermented admixture may be labeled. In step **404**, measure quantity of admixture may be put into each of the labeled containers. In step **406**, each of the containers may be sealed with a cover. The sealing can be done using cellophane sheets. A tiny hole can be made to vent extra build up of fermentation related gas formation. In step **408**, lid may be placed and the container may be fully sealed. In step **410**, a quality check may be performed and an expiration date may be stamped on each of the sealed containers. This may ensure proper storage of food products with predictable shelf life. In step **412**, all the stamped containers may be stored for delivery through distribution process. The distribution process is explained in the steps below.

**[0036]** The stamped containers may be stored in a cold storage till the stamped containers are shipped **414**. In step **416**, the shipped containers may be locally stored or delivered in cold vans. Alternatively, in step **418**, the shipped containers may be delivered to customers by storing in a dry ice.

**[0037]** FIG. **5** illustrates an automation module **500** implemented the manufacturing unit as illustrated in FIG. **1**. The Automation module **500** may include a temperature control module **501**, a solid control module **502**, an electricity usage reading module **503**, a time control module **504**, a resistance measurement module **505**, a microprocessor module **506**, a motor control module **508**, a pressure control module **510**, a pump control module **511**, a seal control module **513**, a user interface module **514**, a horizontal control module **515**, an alert module **516**, a horizontal control module **517**, a cleaning cycle module **518**, a blade control module **519**, a liquid control module **524**, a movement control module **520**, a consistency module **522**, a robotic arm control module **515**, and a barcode module **526**, according to one embodiment. An alert module **515** to communicate an alert to the data processing device when there is a mismatch in requirement information and stock information. A sensing module **530**

**[0038]** The temperature control module **501** may be configured to control temperature at various manufacturing units. The temperature control module **501** may include one or more temperature sensors being placed in different units of manufacturing unit. In one embodiment, the temperature control module **501** may control temperatures at fermentation unit for ensuring fermentation of the admixture. In addition, the temperature control module **501** will control the temperature at the storage of the sealed containers storage. The feedback to the temperature control module **501** may be provided through the temperature sensors. Based on the feedback and the preprogram programmed into the computing devices controlling the manufacturing unit, the temperature control module **501** switches on heater or cooler to maintain the temperature programmed into the computing devices controlling the manufacturing units. The solid control module **502** may be configured to dispense a measured quantity of solid edible material into the container.

**[0039]** The electricity usage reading module **503** may obtained electricity usage in grinding operations to determine requirement of water while performing grinding. Based on the feed back from the resistance due to increased electrical consumption and resistance measurement module **505** reading speed of the motor may be increased or decreased to achieve optimal consistency for the batter. The time control module **504** may maintain timing information in at least one of the soaking process **110**, the grinding process **112** and the fermentation process **114**. The time control module **504** may include timers to manage the aforementioned processes. The resistance measurement module **505** may measure the resistance measured at the grinding process **112**. The resistance measurement is performed to determine the additional requirement of water and/or the motor speed needs to be adjusted. The microprocessor module **506** may control each micro controller of the manufacturing units.

**[0040]** The microprocessor module **506** may communicate commands to each of the micro controllers of the manufacturing unit to perform specific tasks. For example, the microprocessor module **506** may communicate a command to a mixer in the mixing unit to enable the mixer in the mixing unit to perform thorough mixing of admixture. The microprocessor module **506** also monitors coordinates and controls the functions of other modules in the automation module **500**. The motor control module **508** may be configured to control the speed of motor in the grinder in the grinding process. The motor control module **508** many receive inputs from electricity usage reading module **503**, the resistance measurement module **505** and the micro processor module **506** to increase or decrease the speed of motor in the grinder of the grinding module. The pressure control module **510** may be used for proving a specific pressure in the closed environment for fermentation process.

**[0041]** The pump control module **511** may be configured to pump sufficient amount of water into the soaking and the grinding processes. The seal control module **513** may be configured to seal the packed container such that there is no leakage of admixture from the container. The user interface module **514** may be configured for providing at least one of status update, stock update, production update, requirement update, shipping update, quality update, order, target etc. The user interface module **514** also enables an administrator of the manufacturing unit to administer various problems, such as capacity of the manufacturing unit. In addition, the user interface module **514** also enables the administrator to update the software, add software patches, change configuration, speed etc of the manufacturing unit through the automation module **500**. The dispensing of the batters of the different edible materials into the mixing container may be controlled

through the vertical control module **515**. Vertical control module **515** may also assist in storing the containers.

**[0042]** The robotic arm control module **525** may be configured to control the robotic arm to perform specific tasks such as lifting and placing the containers, transferring the contents of the containers etc. The alert module **516** may be configured to generate alerts to at least one of the following situation; at least one of a machinery malfunctions, process failures, edible material stock depletion, leakage and temperature variation during fermentation, storage etc. The horizontal control module **517** is configured to control the movement of the conveyor belt to enable proper placement of containers for at least one of addition of water, mixing, packing, stacking etc. The cleaning cycle module **518** is configured to clean he edible material by washing of edible material using water before the soaking process **110**. The blade rotation control module **519** is configured to control grinding blades in the grinder while performing grinding operation **112**. The liquid control module **524** is configured to control the flow of water in grinding process. The movement control module **520** is configured to control the packing process by monitoring the movement of packed sealed containers in the premises of the manufacturing unit.

**[0043]** The consistency module **522** is configured to control the viscosity and granularity of the batter being prepared in the grinding process. The consistency module **522** may include sensors that measure viscosity and granularity of the batter in the grinding process. Based on the feedback obtained from the viscosity and granularity sensors, the consistency module **522** may enable the grinder to perform grinding for additional duration of time for generating an optimal quality of batter. The bar code module **526** is configured to generate a unique bar code for each one of the sealed containers. A sensing module **530** to weigh the storage bins to communicate a weight of the storage bins to the data processing system to determine quantity of the sealed packing container in the storage bins. An inventory module **528** to convey requirement information to the data processing device for material inventory, product inventory etc.

**[0044]** FIG. **6** is a flow diagram illustrating a generation of admixture. In one embodiment, an edible material **604** and a liquid **602**, for example, water may be added into a container for cleaning and soaking. The amount of liquid being added into the container may be controlled through the pump control module **511**. The solid control module **502** may be used to control the flow of solid edible materials. The user interface module **514** may be used to monitor the quantity of liquid and edible material in the container. In step A **606**, the aforementioned solid edible material and the liquid after mixing, may be stored for predetermined duration of time to soak the solid edible material. Each of the measured soaked solid edible material may be put into separate grinders for grinding process **112**. The grinding process may be initiated by motor control module **508**. The speed of the rotation of the blades in the grinder may be observed through a blade rotation control module **619**. Based on the input obtained from the blade rotation control module **519**, motor control module **508** may increase or decrease the speed of motor to generate a batter at an optimal consistency. The consistency of the batter may be measured through the consistence module **522**. The consistency module **522** may provide input to the motor control module **508** to perform grinding. The generated batter, in step B may be sent for mixing process **113**. The batter of various edible materials may be mixed through a mixer.

**[0045]** The mixing container may be placed at a location to enable dispensing of batters of different edible materials into a mixing container. The movement of the conveyor carrying the mixing container may be controlled through horizontal control module **517**. The dispensing of the batters of the different edible materials and grounded spices may be controlled through the vertical control module **515**. The admixture generated therein the mixing process **113** may be sent for fermentation process in step C **609**. The fermented batter may be stored in a closed environment, wherein the temperature may be controlled through the temperature control module **501** and the pressure may be controlled through the pressure controlled module **510**. The admixture may be stored for a predetermined duration of time, wherein the time being monitored through the time control module **504**. The stored admixture may be sent to packaging **116** processes and distributing process **118**. The premeasured quantity of admixture may be put in standard containers for packing. The bar code module **526** may be used for placing a unique bar code on each of the packing container. The alert module **515** may be used to detect a sealed container with weight beyond the standard weight. The pressure control module **510** may be used for monitoring the pressure for lid closure. The packed and sealed containers may be placed in a cold storage for distribution.

**[0046]** FIG. **7** is a perspective view illustrating a grinding process **112** according to one embodiment. The premeasured quantity of the soaked edible material **702** may be put in a grinder to generate a batter of optimal consistency. An appropriate amount of water may be added into the grinder to enable the grinder to generate the batter. As the grinding process **112** is initiated, the rotation of the blade may be monitored by blade rotation control module **519** to determine the speed of the rotation of blades for grinding. The resistance measurement module **505** may determine the resistance in grinding operation. Based in inputs from the resistance measurement module **505** and the blade rotation control module **519**, the microprocessor module **506** may communicate a control signal to the controller of the grinder to increase or decrease the speed of the rotation of blades and motor control module **508** in the grinder to generate the batter of optimal consistency. The consistency of the batter may be checked through the consistency module **518**. Based on the feedback obtained from the consistency module **518** and the microprocessor module **506** may communicate a signal to microcontroller of the grinder and motor control module **508** to perform grinding operation for additional period time or to stop the grinding operation based on the consistency of the batter.

**[0047]** FIG. **8** illustrates various phases of preparing the admixture. A phase **1 802** is corresponds to a phase of soaking and initial grinding. A resultant of the phase **1** is a wet and granular edible materials. In the phase **1**, the solid edible materials are soaked for a predetermined amount of time and placed in grinding operation. In phase **2**, the grinding process **112** is continued to obtain a semi solid state of the solid edible materials. The electricity usage reading module **503**, the resistance measurement module **505**, the motor control module **508**, the pump control module **511** and the blade rotation module **519** are used in the grinding process **112** to obtain the batter of optimal consistency with required viscosity and granularity. A phase **3** is a state where batter is in a state of semi liquid. The phase **3** is a state that is not the right consistency and viscosity. In the current invention the goal is achieve phase **2** semi solid **804** phase.

**[0048]** FIG. **9** is a diagrammatic system view **900** of a data processing system in which any of the embodiments disclosed herein may be performed, according to one embodiment. Particularly, the diagrammatic system view **900** of FIG. **9** illustrates a processor **902**, a main memory **904**, a static memory **906**, a bus **908**, a video display **910**, an alpha-numeric input device **912**, a cursor control device **914**, a drive unit **916**, a signal generation device **918**, a network interface device **920**, a machine readable medium **922**, instructions **924**, and a network **926**, according to one embodiment.

**[0049]** The diagrammatic system view **900** may illustrate a physical machine, the mass migration desktop virtualization server **402**, in which one or more operations disclosed herein are performed. The processor **902** may be a microprocessor, a state machine, an application specific integrated circuit, a field programmable gate array, etc. The main memory **904** may be a dynamic random access memory and/or a primary memory of a computer system.

**[0050]** The static memory **906** may be a hard drive, a flash drive, and/or other memory information associated with the data processing system. The bus **908** may be an interconnection between various circuits and/or structures of the data processing system. The video display **910** may provide graphical representation of information on the data processing system. The alpha-numeric input device **912** may be a keypad, a keyboard and/or any other input device of text (e.g., a special device to aid the physically handicapped).

**[0051]** The cursor control device **914** may be a pointing device such as a mouse. The drive unit **916** may be the hard drive, a storage system, and/or other longer term storage subsystem. The signal generation device **918** may be a bios and/or a functional operating system of the data processing system. The network interface device **920** may be a device that performs interface functions such as code conversion, protocol conversion and/or buffering required for communication to and from the network **926**. The machine readable medium **922** may provide instructions **924** on which any of the methods disclosed herein may be performed. The instructions **924** may provide source code and/or data code to the processor **902** to enable any one or more operations disclosed herein.

**[0052]** FIG. **10** is a process **101** illustrating soaking and grinding operation **112** according to one embodiment. FIG. **10** illustrates edible material dispensers **1002-1004**, the liquid dispenser **602**. The edible material dispensers **1002-1004** include a container and an opening. The opening area to dispense edible material may be controlled through a mechanism and the mechanism may be controlled by a motor. Each of the motor of the edible material dispenser may be configured to dispense the edible material based on the edible material in the edible material container. The quantity of the edible material to be dispensed into a specific container may be predetermined. Also, the liquid dispenser **602** may include one or more dispensing valves to dispense a liquid into the specific containers.

**[0053]** In one embodiment, the dispensing valve may also be controlled through the microprocessor module **506**. The edible material dispensers **1002-1004** and liquid dispenser may be fixed in a location. The containers may be brought to the location of the edible materials dispensers and liquid dispensers by placing the containers on a horizontal platen. The sensors on the horizontal platen may sense the location of the containers to be displaced. The location information of the containers may be communicated to the microprocessor module **506**. The microprocessor module **506** may communicate a command to the horizontal platen to move the container to the location of the dispensers, such that the edible material and the liquid may be dispensed into the containers. Further, the container comprising the edible materials and the liquid may be picked by the robotic arm and placed it in a location for soaking.

**[0054]** The edible material may be soaked for a predetermined duration of time. Further, the container containing the soaked edible material may be picked by the robotic arms to transfer **1017** the soaked edible materials into grinders' **1013**A-**1013**B. In one embodiment, the soaked edible material **1002** may be dispensed into a grinder **1013**Ausing a edible material dispenser **1020**A and B. Similarly, the soaked edible material **1004** may be dispensed into the grinder **1013**B. The grinders **1013**A-**1013**B are machines that are designed for edible materials. Each of the grinders may include a blade designed for the purpose of grinding the edible materials. The blades **1015**A-**1015**B of the grinder **1013**A and **1013**B may be controlled through a motor **1019**A and **1019**B respectively. The motors **1019**A AND **1019**B may be controlled through the motor control module **508**.

**[0055]** FIG. **11** is a continuation of the process **101** illustrating additional operations according to one embodiment. The batter obtained by grinding the edible material **1002** in the grinder **1013**A and **1013**B may be collected from the grinders in a mixing container. The mixing container is placed on a conveyor belt. The mixing container may receive the measured volume of batter from each of the grinder. The mixing container may be transported further on the conveyor belt **1111** to a location where the grounded spices can be dispensed into the mixing container **1121**. In one embodiment, there may be one or more grounded spice dispensers **1102-1106** (e.g., as illustrated in the figure). The spices may be dispensed using the spice dispenser machine **1130** A-C.

**[0056]** Furthermore, the grounded spices many be dispensed into the mixing container. The spices may be salt, sugar, chili powder, asafetida, fenugreek seed powder, coriander leaves, curry leaves etc. Further, the mixing container may be transported to fermentation chamber. Furthermore, the mixing container may be placed in an environment at a controlled temperature and pressure for a predetermined duration of time. A measured volume of admixture may be transferred to each of the packing containers **1117**. Further, a robotic arm **1115** may be used for packing, sealing and applying barcode to each of the sealed containers. The sealed containers **1122** may be placed in storage bins **1119**. Weight sensors **1120** may be used to determine the total weight of the sealed containers in the storage bins **1119**. In addition, radio frequency (RF) id tags may be coupled to a set of storage bins **1119** to determine the location of the storage bins being stored in the manufacturing unit.

**[0057]** FIG. **12** illustrates a distribution management **1250** according to one embodiment. The RF id tag may be sensed in the manufacturing unit through RF id readers periodically. Further, based on the client orders, the storage bins **1119** may be shipped to client locations. The storage bins **1119** may be transported to the client locations via road **1204** or via air **1202**. The RF id tags may be removed and information may be updated regarding dispatch of the storage bins **1119** from the manufacturing unit.

**[0058]** Although the present embodiments have been described with reference to specific example embodiments, it will be evident that various modifications and changes may be

made to these embodiments without departing from the broader spirit and scope of the various embodiments. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

What is claimed is:

**1**. A process, comprising:
soaking a pre-measured quantity of a cereal and a pulse for a pre-determined time to form a soaked cereal and a soaked pulse;
cleaning the soaked the cereal and the pulse by at least one of an automated machine and a manual process;
draining an excess water from soaked cereal and pulse;
transferring the soaked cereal and the soaked pulse to a first grinder and a second grinder;
adding pre-determined amount of water in the grinder; and
grinding the soaked cereal and soaked pulse individually in the first grinder and the second grinder to create a first batter and a second batter.

**2**. The process of claim **1**, further comprising:
mixing the first batter and second batter to make a final batter;
adding spices to the final batter;
stirring the final batter with the spices;
fermenting the final batter at room temperature for a fixed time; and
storing the final batter at ambient temperature before packing.

**3**. The process of claim **2**, wherein the fixed temperature is between 45-70° C., and wherein ambient temperature is between 55-60° C.

**4**. The process of claim **3**, further comprising packing the final batter in a container designed thereof.

**5**. A method, comprising:
dispensing a soaked cereal for a predetermined period of time into a first grinder;
dispensing a liquid material into the first grinder comprising the soaked cereal to cover the top; and
controlling the consistency using a consistency module to generate a batter of optimal consistency through at least one of an automatic adjustment and a manual adjustment of a batter of the soaked cereal and the liquid material surrounding a blade of the apparatus based on an electrical property associated with a rotation of the blade.

**6**. The method of claim **5**, further comprising:
dispensing a soaked pulse for a predetermined period of time into a second grinder;
dispensing the liquid material into the second grinder comprising the soaked pulse to cover the top; and
controlling a consistency of the batter using the consistency module to generate an admixture of optimal consistency through at least one of an automatic adjustment and a manual adjustment of a batter of the soaked pulse and the liquid material surrounding a blade of the apparatus based on an electrical property associated with a rotation of the blade.

**7**. The method of claim **6**, further comprising:
grinding the soaked cereal to generate the batter of the soaked cereal;
grinding the soaked pulse to generate the batter of the soaked pulse; and
mixing the batter of the soaked cereal and the batter of the soaked pulse to generate an admixture.

**8**. The method of claim **7**, further comprising:
monitoring the granularity and viscosity of the batter while performing grinding.

**9**. The method of claim **8**, wherein grinding is stopped once the batter with granularity and viscosity is obtained.

**10**. The method of claim **7**, further comprising:
mixing the batter of the soaked cereal and the batter of the soaked pulse using a ratio to make a admixture;
adding at least one spice to the admixture; and
fermenting the admixture for a predetermined amount of time.

**11**. A method of claim **10**, wherein the cereal is at least one of be rice, wheat, semolina, barley, maize, oats, rye, sorghum, varieties of rice such as parboiled rice, wild rice and brown rice, wherein the pulse is at least one of be black gram, red gram, mung bean, chickpea and bengal gram.

**12**. A method of claim **10**, wherein the spice is at least one of salt, sugar, chili powder, asafetida, fenugreek seed powder, coriander leaves and curry leaves.

**13**. The method of claim **10**, further comprising:
removing the excess air from a fermented admixture;
pouring the admixture in a container;
labeling the container;
stamping the container with an expiration date; and
storing the container till it is ready for a shipment.

**14**. A system comprising:
at least one dispenser controlled through a data processing device to dispense a predetermined quantity of an edible material into at least one of a container;
a liquid dispenser controlled through the data processing device to dispense a predetermined quantity of liquid into the at least one of the container to soak the at least one of the edible material for a predetermined duration of time;
a first conveyor machine controlled through the data processing device to place the at least one container into a position to enable the at least one dispensers and the liquid dispenser to dispense into the container and to place the at least one container in a position to enable a first robotic arm to transfer the soaked edible materials in at least one of the containers into at least a grinder;
the first robotic arm to hold the container with appropriate pressure to transfer the soaked edible material into the at least one of the grinder; and
the at least one of the grinder controlled through the data processing device to grind at least one of the soaked edible material into a batter of optimal consistency.

**15**. The system of claim **9**, further comprising:
at least one spice dispensing machine to dispense grounded spices into the batter of optimal consistency;
at least one mixing apparatus to mix the batter of the edible materials and the grounded spices in a mixing container; wherein the batter is at least one of a cereal batter, a pulse batter and a pulse batter; and
a second robotic arm to place the mixing container into a fermentation chamber to perform a fermentation process.

**16**. The system of claim **10**, further comprising:
the second robotic arm to place the mixing container from the fermentation chamber at a predetermined location to enable dispensing of the mixed batter into a packing container on the second conveyor machine;

a third robotic arm controlled through the data processing device to seal the packing container and to apply a label and barcode on the sealed packing container;

a fourth robotic arm controlled through the data processing device to place the sealed packing container into storage bin to be distributed through a distribution system; and

a sensing module to weigh the storage bins to communicate a weight of the storage bins to the data processing system to determine quantity of the sealed packing container in the storage bins.

**17**. The system of claim **11**, wherein the data processing device enabled through a set of codes executed through a processor of the data processing device to manage the system.

**18**. The system of claim **10**, wherein the fermentation process is performed in room temperature.

**19**. The system of claim **9**, wherein the data processing device to communicate with the at least one edible material dispenser, a liquid dispenser, a horizontal platen, the first robotic arm the at least one grinder, at least one spice dispensing machine, at least one mixing apparatus, a second robotic arm, the mixing machine, a third robotic arm, a fourth robotic arm, and a sensing module through wired or wireless communication.

**20**. The system of claim **12**, further comprising:

an inventory module to convey requirement information to the data processing device;

a database to maintain information associated with at least one of stock of the edible material, the liquid, the grounded spice, and packing container; and

an alert module to communicate an alert to the data processing device when there is a mismatch in requirement information and stock information.

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