(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 August 2007 (16.08.2007)

PCT

(10) International Publication Number
WO 2007/091265 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/IL2007/000177

(22) International Filing Date: 8 February 2007 (08.02.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/771,857 10 February 2006 (10.02.2006) US
60/811,166 7 June 2006 (07.06.2006) US

(71) Applicant and
(72) Inventor: **NURIELY, Eran** [IL/IL]; 3 Ahoresh Street, Kiryat Savionim, 56470 Yahud (IL).

(74) Agent: **Dr. Sarah Presenti & Co. Law Offices**; 96 Yigal Alon Str., 67891 Tel Aviv (IL).

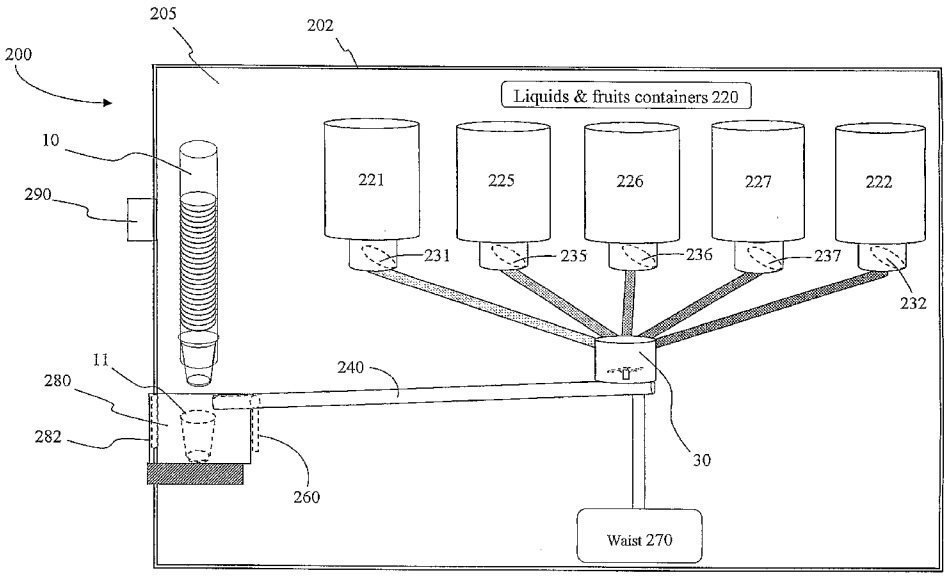
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** VENDING APPARATUS FOR DISPENSING DRINKS THAT CONTAIN FRUITS OR VEGETABLES



(57) **Abstract:** A vending machine for dispensing drinks which include fruits and vegetables that are cut into very small particles. The drink can be milk based, orange juice based or based on any other liquid drinks. The machine comprises a housing containing a plurality of compartments for holding one or more produce or produce pieces and one or more kinds of drinkable liquids; a mechanism for cutting and/or crushing the produce or produce pieces; a mechanism for dispensing a cup; a compartment where the user can pick up the filled cup with selected drink; and a controller for automatically initiate the drink preparation in response to a customer's selection.

WO 2007/091265 A2

VENDING APPARATUS FOR DISPENSING DRINKS THAT CONTAIN FRUITS OR VEGETABLES

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit under 35 USC 119(e) from US provisional application 60/771,857 filed on February 10th, 2006, and US provisional application 60/811,166 filed on June 7th, 2006, the disclosure of which are included herein by reference.

FIELD OF THE INVENTION

The present invention relates to a vending apparatus for selectively dispensing drinks, and in particular drinks that contain a fresh fruits and/or a vegetable.

BACKGROUD AND PRIOR ART

There are many types of vending machines in the market, but vending machines designated for dispensing drinks that includes small fruit or vegetable particles and that are based on selected drink such as milk based, orange juice based or any other liquid drinks, are not yet available.

U.S patent 4,759,471 given to Takahashi suggested a process for preparing fruit juice beverages containing solid matter such as pulp materials whereas this process includes a deaeration treatment to remove air bubbles occluded in the fruit juice. This process is not needed on the one hand and the invention does not offer any embodiments for carrying out said process.

Prior art vending machines provide automatic dispensers for juice extracted from a single kind of fruit or vegetable, for example, vending machines that provide citrus fruit juices which squash or grind a desired number of citrus fruits at the moment of serving. But prior art vending machines are designated for a single produce only, mostly citrus fruits, from which they extract the natural juice. Such machines are described in U.S patent 4,974,505 given to Torrisi, U.S patent 5,544,572 given to Garmendia, U.S patent 5,743,176 given to Anderson et al, U.S patent 6,234,071 given to Catarain Arregui and others.

There are non-vending machines that provide that can extract juice from just about any kind of fruit or vegetable: carrots, grenades, apples, grapes, citrus, papers, tomatoes, pears and so

on and so forth just about any fruit or vegetable or leaves or grass. These machines can separate the juice from the solid part of the fruit or vegetable. Such non-vending machines are described in U.S patent 6,968,777 given to Lin, U.S patent 6,862,982 given to Wang, U.S patent 6,397,736 given to Tseng et al, U.S patent 6,609,455 given to Fouquet and others.

Thus, there is a need for and it would be advantageous to have a vending machine that can provide a user with a drink which contains fruits, vegetables, a mixture of fruits and/or vegetables, or a shake drink which contains small produce particles in measured portions mixed with a selected drinkable liquid such as milk, orange juice and so on, as well as other ingredients such as ice cream, crushed ice, sugar, etc. Making drinks/shakes that are freshly produced from multiple produce products, provides drinks/shakes enriched with multiple dietary ingredient, such as vitamins, that cannot be provided from a single fruit or vegetable.

SUMMARY OF THE INVENTION

The term "produce" is used herein to refer to fruits, vegetable, fruits pieces and/or vegetable pieces. The fruits and/or vegetables can be peeled or unpeeled.

The terms "cut", "grind", "blend" and "crush" are used herein interchangeably.

The term "small particles" is used herein to refer to size of produce particles after being cut, grinded and/or crushed, the size being small enough to be drunk by a person after being mixed with any drinkable liquid.

The term "blender" is used herein to refer to a mechanism for cutting, grinding and/or crushing produce items or produce pieces into small particles, as well as a mechanism for squashing and squeezing produce items or produce pieces to extract juice from the produce items or produce pieces.

According to the teachings of an embodiment of the present invention there is provided a vending apparatus for dispensing drinks containing small produce particles having an enclosed housing, the housing including:

a) a mechanism for dispensing a cup.

b) at least one produce container, which can hold one or more produce items or produce pieces. The produce can be any kind of fruit and/or vegetable. The produce container may hold a mixture of produce items and/or produce pieces.

c) at least one liquid container, which can hold one or more kinds of drinkable liquids, which are selected from the group of liquids including milk, ice cream, yogurt, orange

juice, beverage, coffee, alcoholic drinks, liquid protein, any kind of juice, any kind of dairy product.

d) at least one mechanism for cutting, grinding and/or crushing the produce or produce pieces. The cutting mechanism is selected from the group including a blender, a mixer, a grinder, and is referred to as a blender. Each produce container may be coupled with a blender.

e) a mechanism for transferring the produce or produce pieces from the produce container to the at least one blender, such as a door that opens up for a preset period of time. The door can be coupled with a pipe that leads the produce from the lower end of the produce container to upper end of the blender.

f) a mechanism for transferring the small produce particles and juice from the at least one blender to the dispensed cup, such as a pipe.

g) a compartment where the dispensed cup is filled with the drink produced can picked up.

h) a controller for automatically initiate the drink preparation in response to a customer's selection.

The liquid container may contain a food ingredient selected from the group including sugar, powder protein, chocolate, candies. The liquid container may contain a mixture of a drinkable liquid and a food ingredient. The produce container may contain a mixture of produce items and at least one food ingredient.

According to the teachings of embodiments of the present invention there is provided a method for dispensing drinks from a vending apparatus, the dispensed drink containing small produce particles. A drink selecting procedure precedes the drink production.

In a drink selecting procedure, according to the teachings of embodiments of the present invention, available drinks menu is displayed to the user. If the user selected a drink that is not available, a message is displayed to the user, who in turn can make a new selection. After a selection is made the cost is displayed to the user, who can make the payment. The vending apparatus accepts the payment and initiates the drink production. The initiation includes, but not limited to, identifying and selecting the containers containing selected produce and selected base drink, and selecting at least one blender to be used.

Once the drink selecting procedure is complete, the automatic process for producing the selected drink is ready to commence, according to the teachings of embodiments of the present invention. A cup is dispensed and place in a collecting location, such as the compartment where

the dispensed cup will be filled and picked up by the user. Selected produce or produce pieces are transferred to at least one blender. At least one selected base drink can be transferred to at least one blender or transferred to the dispensed cup. The transferred produce and or produce pieces and/or base drink and/or other food ingredients are cut, crashed and blended into juice and small particles, which are transferred to the dispensed cup. The produced drink is delivered to the user. It should be noted, that if the base drink(s) is to be transferred directly to the dispensed cup, the base drink can be transferred either before or after transferring the produce juice and small particles to the dispensed cup.

According to the teachings of an embodiment of the present invention there is provided a vending apparatus for dispensing drinks containing small produce particles having an enclosed housing, the housing including:

a) a mechanism for dispensing a cup.

b) at least two produce container, which can hold one or more produce items or produce pieces. The produce can be any kind of fruit and/or vegetable. The produce container may hold a mixture of produce items and/or produce pieces.

c) at least one mechanism for cutting, grinding and/or crushing the produce or produce pieces. The cutting mechanism is selected from the group including a blender, a mixer, a grinder, and is referred to as a blender. Each produce container may be coupled with a blender.

d) a mechanism for transferring the produce or produce pieces from the produce container to the at least one blender, such as a door that opens up for a preset period of time. The door can be coupled with a pipe that leads the produce from the lower end of the produce container to upper end of the blender.

e) a mechanism for transferring the small produce particles and juice from the at least one blender to the dispensed cup, such as a pipe.

f) a compartment where the dispensed cup is filled with the drink produced can picked up.

g) a controller for automatically initiate the drink preparation in response to a customer's selection.

The vending apparatus may further include at least one liquid container, which can hold one or more kinds of drinkable liquids, which are selected from the group of liquids including milk, ice cream, yogurt, orange juice, beverage, coffee, alcoholic drinks, liquid protein, any kind

of juice, any kind of dairy product. The at least one drinkable liquid is transferred to the dispensed cup by a transfer mechanism such as a pipe.

According to the teachings of an embodiment of the present invention there is provided a vending apparatus for dispensing drinks containing small produce particles having an enclosed housing, the housing including:

a) a mechanism for dispensing a cup.

b) a mechanism for moving said dispensed cup, such as a moving belt.

c) at least one produce container, said produce container comprising compartment, each of which can hold one or more produce items or produce pieces. The produce can be any kind of fruit and/or vegetable. A produce compartment may hold a mixture of produce items and/or produce pieces.

d) at least one liquid container that includes compartment, each of which can hold one or more kinds of drinkable liquids, which are selected from the group of liquids including milk, ice cream, yogurt, orange juice, beverage, coffee, alcoholic drinks, liquid protein, any kind of juice, any kind of dairy product.

e) at least one blender.

f) a mechanism for transferring the produce or produce pieces from a compartment of the produce container to the dispensed cup, such as a door that opens up for a preset period of time. The door can be coupled with a pipe that leads the produce from the lower end of a produce compartment to the dispensed cup.

g) a compartment where said dispensed cup is filled with the drink produced can picked up.

h) a controller for automatically initiate the drink preparation in response to a customer's selection.

A liquid compartment may contain a food ingredient selected from the group including sugar, powder protein, chocolate, candies. The liquid compartment may contain a mixture of a drinkable liquid and a food ingredient. A produce compartment may contain a mixture of produce items and at least one food ingredient.

In embodiments of the present invention, a liquid container or a liquid compartment may contain water or other cleaning liquids to clean at least one blender. A blender may also include

mechanism to remove and collect waist, such as peelings, seeds and other solid waist and pulp, from the blender.

In embodiments of the present invention, at least a portion of the vending apparatus housing is refrigerated and other portions of the housing can be served as freezers to preserve various food ingredients. At least a portion the housing walls is made of clear materials, such as glass, and thereby transmitting substantially all wave length of light through the clear housing walls portions.

In embodiments of the present invention, the mechanism for transferring the produce or produce pieces from the produce container or produce compartment to the blender or to the dispensed cup can be a picker, such as a moving arm including a grabbing mechanism.

In embodiments of the present invention, the mechanism for transferring the produce or produce pieces from the produce container or produce compartment to the blender can be a pushing mechanism, wherein the pushing mechanism pushes the produce upwards by some pushing mechanism, such as a piston, into the blender or the dispensed cup.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become fully understood from the detailed description given herein below and the accompanying drawings, which are given by way of illustration and example only and thus not limitative of the present invention, and wherein.

FIG. 1 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention, whereas each produce container is coupled with a blender.

FIG. 2 is a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus as in **Figure 1**, according to embodiments of the present invention.

FIG. 3 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention, whereas one blender serves all ingredients.

FIG. 4 is a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus as in **Figure 3**, according to embodiments of the present invention.

FIG. 5 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention, whereas multiple blenders serve multiple containers.

FIG. 6 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention, the drink being mixed in the serving cup.

FIG. 7 is a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus as in **Figure 6**, according to embodiments of the present invention.

FIG. 8 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles, according to embodiments of the present invention.

FIG. 9 is a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus as in **Figure 8**, according to embodiments of the present invention.

FIG. 10 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention.

FIG. 11 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention.

FIG. 12 is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

The present invention provides a vending apparatus for selectively dispensing drinks that contain a mixture of fresh produce, containing ingredients from multiple produce products. The dispensing drink or shake-drink contains small produce particles in measured portions that can be mixed with a selected drinkable liquid such as milk, orange juice and so on, as well as other ingredients such as yogurt, ice cream, crushed ice, sugar, etc.

It should be noted that in the preferred embodiment of the present invention drinks are produced from fresh produce products, but the present invention is not limited to fresh produce products and preserved produce products cat also be used and are within the scope of the present invention.

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided ,so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. The methods and examples provided herein are illustrative only and not intended to be limiting.

A first embodiment of the invention will now be described with reference to **Figure 1** which is a schematic side view of a vending apparatus **100** for dispensing drinks containing small produce particles according to embodiments of the present invention, the drink being mixed in a blender.

Vending apparatus **100** includes a housing **102** which contains:

a) a compartment **10** for holding dispensable cups **11**;

b) at least one container **120** which holds a fresh produce product or produce pieces. Relevant produce products will be peeled off before filling the containers. A produce container may also be mixed with ice. The number of containers **120** is limited only by the space in housing **102**;

c) at least one container **120** which holds a base drink such as milk, yogurt, ice cream, orange juice, beverage, coffee, alcoholic drinks or any other liquid drink;

d) optionally, one or more containers **120** may hold other ingredients such as sugar, powder or liquid protein or any other ingredient for mixing purposes;

e) optionally, one or more containers **120** can hold water for cleaning purposes;

f) each produce container **120** is coupled with a blender (**30**, **40**, **50**) for cutting, grinding and/or crushing the produce into small particles;

g) mechanism **140** for transferring the juices and small produce particles from blenders **30**, **40** and/or **50** into cup **11**;

h) optionally, a cleaning mechanism to clean each blender (**30**, **40**, **50**);

i) a mechanism for moving the fresh produce/produce-pieces into a selected blender;

j) optionally, a mechanism **170** for collecting from a blender produce waist such as peelings, seeds and other solid waist and pulp;

k) a dispensing compartment **180** for the customer to pick cup **11** with the drink he selected, when ready; and

l) a control panel **190** for the customer to operate the apparatus, which can be activated from the outside, normally by a customer who pays for the drink by coins, credit card, debit card, prepaid card, bank card, or by paper money or other cash.

Internal space **105** of vending apparatus **100** is at least partially refrigerated to preserve the freshness of the various ingredients, and some of internal space **105** can be a freezer. The front and other portions of housing **102** walls can optionally be made of clear material, such as glass, to allow the customer and passers-by to watch the drink being prepared.

The process of operating a vending apparatus **100** for dispensing drinks that contains fresh produce products will now be described with reference to **Figure 2**. **Figure 2** is a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus **100** as in **Figure 1**, according to embodiments of the present invention.

To operate vending apparatus **100**, available drinks or drink-shakes containing mixtures of produce products are displayed on massage screen payment control box **190**, in **steps 720** and **722**. A user starts process **700** of making a drink of his selection when the user goes through the preprocess steps of making the drink selection, the preprocess steps are finalized when the user makes a payment in **step 740**. Process **700** then proceeds automatically to produce the selected drink. Process **700** includes the following steps:

Preprocess steps:

Step 710 – The user selects a juice or a shake from available mixtures of produce products via payment control box **190**, which are displayed in **steps 720** and **722**.

Steps 721/723 – If the user selection is not in stock, an appropriate message is displayed in **step 730** and the user can make a new drink selection in **step 710**.

Step 740 – the user makes the payment via control box **190** or pushes a start button or any other mechanism a like.

Process steps:

Once payment is accepted by vending apparatus **100**, an automatic cycle of producing the selected drink begins.

Step 750 – a single cup **11** drops into dispensing compartment **180**.

Step 760 – each produce-product/produce-pieces selected in **step 710** is transferred from produce containers **125**, **126** and/or **127** into a coupling blender **30**, **40** and/or **50**, respectively. Each container **120** includes an opening mechanism (**131**, **132**, **135**, **136** and **137**) which operates to transfer the selected produce from the produce container **120** into the container coupled blender. For example, the opening mechanism may include a door that opens and the produce drops into the blender just below the container **120**.

Step 770 – a measured amount of liquid, such as milk or orange juice and the like, is transferred to at least one blender. The liquid can be added a few seconds before the transfer of the produce, along with the produce or a few seconds after the produce has been transferred.

Step 780 – each blender **30**, **40** and/or **50** containing at least one produce. The blender grinds the produce into small particles, while mixing the small particles with the liquid, if added to the blender.

Step 785 – each blender **30**, **40** and/or **50** optionally contains a waist removal mechanism operatively attached to a waist disposal **170**, to remove any produce waist from each blender, as needed.

Step 790 – the blended juice from each blender **30**, **40** and/or **50** is transferred to cup **11** in dispensing compartment **180** by a transfer mechanism **140**. The client may need to open a door **182** in order to reach into compartment **180** and pick up cup **11** with the produced drink or shake.

Step 795 – each blender **30**, **40** and/or **50** is optionally cleaned by some cleaning mechanism, as needed. The cleaning mechanism may include a container **120** which is filled with cleaning liquid such as water, which washes the blenders and the waist is collected by waist removal mechanism **170**.

Step 799 – the vending apparatus **100** enters a wait state, ready for the next drink producing cycle.

In embodiments of the present invention, a container **120** may contain a mixture of produce products, for example, a mixture of bananas and strawberries, a mixture of bananas,

melons and strawberries, a mixture of melons and strawberries, a mixture of pineapple and melon pieces, a mixture of orange pieces and kiwi, and so on and so forth.

In embodiments of the present invention, a container **120** may contain a mixture of ingredients, for example, milk and sugar, orange juice and sugar, sugar and protein and so on and so forth.

Example 1:

A client selects a Banana Strawberry shake based on milk and sugar. Container **125** contains strawberries and container **126** contains banana pieces. Container **121** contains milk and container **122** contains sugar. Opening mechanisms **131, 132, 135** and **136** of containers **121, 122, 125** and **126** respectively, open-up for a preset period of time. Banana pieces are transferred to blender **40**, strawberries are transferred to blender **30,** a pre measured amount of milk is transferred to blenders **30** and **40,** and a pre measured amount of sugar is transferred to blender **40**. Blenders **30** and **40** are operated to grind and blend the mixtures blenders **30** and **40** contain. After a preset period of time the blended mixtures from blenders **30** and **40** are transferred to cup **11** in dispensing compartment **180** by a transfer mechanism **140**. The banana strawberry shake is ready inside cup **11**.

Example 2:

A client selects a Banana Strawberry shake based on milk and sugar. Container **126** contains a mixture of banana pieces and strawberries. Container **122** contains a mixture of milk and sugar. Opening mechanisms **132** and **136** of containers **122** and **126** respectively, open up for a preset period of time, and banana pieces, strawberries and a mixture of milk and sugar are transferred to blender **40**. Blender **40** is operated to grind and blend the mixture of banana pieces, strawberries, milk and sugar. After a preset period of time the banana strawberry shake is ready in blender **40** and is transferred to cup **11** in dispensing compartment **180** by a transfer mechanism **140**.

A second embodiment of the invention will now be described with reference to **Figure 3** which is a schematic side view of a vending apparatus **200** for dispensing drinks containing small produce particles according to embodiments of the present invention, the drink being mixed in a blender.

Vending apparatus **200** includes a housing **202** which contains:

a) a compartment **10** for holding dispensable cups **11**;

b) at least one container **220** which holds a fresh produce product or produce pieces. Relevant produce products will be peeled off before filling the containers. A produce container may also be mixed with ice. The number of containers **220** is limited only by the space in housing **202**;

c) at least one container **220** which holds a base drink such as milk, yogurt, ice cream, orange juice, beverage, coffee, alcoholic drinks or any other liquid drink;

d) optionally, one or more containers **220** may hold other ingredients such as sugar, powder or liquid protein or any other ingredient for mixing purposes;

e) optionally, one or more containers **220** can hold water for cleaning purposes;

f) a blender **30** for cutting, grinding and/or crushing the produce into small particles, thereby producing a drinkable drink or shake;

g) mechanism **240** for transferring the mixed drink from blender **30** into cup **11**;

h) optionally, a cleaning mechanism blender **30**;

i) optionally, a mechanism for moving the fresh produce/produce-pieces into blender **30**;

j) optionally, a mechanism **270** for collecting from blender **30** produce waist such as peelings, seeds and other solid waist and pulp;

k) a dispensing compartment **280** for the customer to pick cup **11** with the drink he selected, when ready; and

l) a control panel **290** for the customer to operate the apparatus, which can be activated from the outside, normally by a customer who pays for the drink by coins, credit card, debit card, prepaid card, bank card, or by paper money or other cash.

Internal space **205** of vending apparatus **200** is at least partially refrigerated to preserve the freshness of the various ingredients, and some of internal space **205** can be a freezer. The front and other portions of housing **202** walls can optionally be made of clear material, such as glass, to allow the customer and passers-by to watch the drink being prepared.

The process of operating a vending apparatus **200** for dispensing drinks that contains fresh produce products will now be described with reference to **Figure 4**. **Figure 4** is a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus **200** as in **Figure 3**, according to embodiments of the present invention.

To operate vending apparatus **200**, available drinks or drink-shakes containing mixtures of produce products are displayed on massage screen payment control box **290**, in **steps 725** and **727**. A user starts process **701** of making a drink of his selection when the user goes through the preprocess steps of making the drink selection, the preprocess steps are finalized when the user makes a payment in **step 741**. Process **701** then proceeds automatically to produce the selected drink. Process **701** includes the following steps:

Preprocess steps:

Step 711 – The user selects a juice from available mixtures of produce products via payment control box **290**, which are displayed in **steps 725** and **727**.

Steps 726/728 – If the user selection is not in stock, an appropriate message is displayed in **step 731** and the user can make a new drink selection in **step 711**.

Step 741 – the user makes the payment via control box **290** or pushes a start button or any other mechanism a like.

Process steps:

Once payment is accepted by vending apparatus **200**, an automatic cycle of producing the selected drink begins.

Step 751 – a single cup **11** drops into dispensing compartment **280**.

Step 761 – each produce-product/produce-pieces selected in step **711** is transferred from the produce container **225**, **226** and/or **227** into a blender **30**. Each container **220** includes an opening mechanism (**231**, **232**, **235**, **236** and **237**) which operates to transfer the selected produce from the produce container **220** into blender **30**. For example, the opening mechanism may include a door that opens and the produce drops into a pipe or tunnel that leads to blender **30**.

Step 771 – if selected, a measured amount of liquid, such as orange juice, beverage and the like, is transferred to blender **30**. The liquid can be added a few seconds before the transfer of the produce, along with the produce or a few seconds after the produce has been transferred.

Step 781 – blender **30** grinds the produce into small particles, while mixing it with the liquid if added to blender **30**.

Step 786 – blender **30** optionally contains a waist removal mechanism operatively attached to a waist disposal **270**, to remove any produce waist from blender **30**, as needed.

Step 791 – the blended juice from blender **30** is transferred to cup **11** in dispensing compartment **280** by a transfer mechanism **240**. The client may need to open a door **282** in order to reach into compartment **280** and pick up cup **11** with the produced drink.

Step 796 – blender **30** is optionally cleaned by some cleaning mechanism, as needed. The cleaning mechanism may include a container **220** which is filled with cleaning liquid such as water, which washes blender **30** and the waist is collected by waist removal mechanism **270**.

Step 798 – the vending apparatus **200** enters a wait state, ready for the next drink producing cycle.

In embodiments of the present invention, a container **220** may contain a mixture of produce products, for example, a mixture of bananas and strawberries, a mixture of bananas, melons and strawberries, a mixture of melons and strawberries, a mixture of pineapple and melon pieces, a mixture of orange pieces and kiwi, and so on and so forth.

In embodiments of the present invention, a container **220** may contain a mixture of ingredients, for example, orange juice and sugar, sugar and protein and so on and so forth.

Example 3:

A client selects a Banana Strawberry shake based on milk and sugar. Container **225** contains strawberries and container **226** contains banana pieces. Container **221** contains milk and container **222** contains sugar. Opening mechanisms **231, 232, 235** and **236** of containers **221, 222, 225** and **226** respectively, open-up for a preset period of time. Banana pieces and strawberries are transferred to blender **30**. A pre measured amount of milk and a pre measured amount of sugar is transferred to blender **30**. Blender **30** is operated to grind and blend the mixtures blender **30** contains. After a preset period of time the blended mixtures from blender **30** is transferred to cup **11** in dispensing compartment **280** by a transfer mechanism **240**. The banana strawberry shake is ready inside cup **11**.

Example 4:

A client selects a Banana Strawberry shake based on milk and sugar. Container **226** contains a mixture of bananas and strawberries. Container **222** contains a mixture of milk and sugar. Opening mechanisms **232** and **236** of containers **222** and **226** respectively, open up for a preset period of time, and banana pieces, strawberries and a mixture of milk and sugar are

transferred to blender **30**. Blender **30** is operated to grind and blend the mixture of banana pieces, strawberries, milk and sugar. After a preset period of time the banana strawberry shake is ready in blender **30** and is transferred to cup **11** in dispensing compartment **280** by a transfer mechanism **240**.

Another embodiment of the invention will now be described with reference to **Figure 5** which is a schematic side view of a vending apparatus **300** for dispensing drinks containing small produce particles according to embodiments of the present invention, whereas multiple blenders can serve multiple containers.

Vending apparatus **300** includes a housing **302** which contains:

a) a compartment **10** for holding dispensable cups **11**;

b) K containers **320** which hold fresh produce product or produce pieces. Relevant produce products will be peeled off before inserting into the containers. A produce container may also be mixed with ice. The number of containers **320** is limited only by the space in housing **302**;

c) N-K containers **320** which hold base drinks such as milk, yogurt, ice cream, orange juice, beverage, coffee, alcoholic drinks or any other liquid drink;

d) optionally, one or more containers **320** may hold other ingredients such as sugar, powder or liquid protein or any other ingredient for mixing purposes;

e) optionally, one or more containers **320** can hold water for cleaning purposes;

f) M blenders (**30**, **40**, **50**) for cutting, grinding and/or crushing the produce into small particles;

g) mechanisms **340** and optionally **341** for transferring the juices and small produce particles from blenders **30**, **40** and/or **50** and optionally from containers **320** which hold selected base liquids and/or ingredients into cup **11**;

h) optionally, a cleaning mechanism to clean each blender (**30**, **40**, **50**);

i) optionally, a mechanism for moving the fresh produce/produce-pieces into a selected blender;

j) optionally, a mechanism **370** for collecting from a blender produce waist such as peelings, seeds and other solid waist and pulp;

k) a dispensing compartment **380** for the customer to pick cup **11** with the drink he selected, when ready; and

l) a control panel **390** for the customer to operate the apparatus, which can be activated from the outside, normally by a customer who pays for the drink by coins, credit card, debit card, prepaid card, bank card, or by paper money or other cash.

Internal space **305** of vending apparatus **300** is at least partially refrigerated to preserve the freshness of the various ingredients, and some of internal space **305** can be a freezer. The front and other portions of housing **302** walls can optionally be made of clear material, such as glass, to allow the customer and passers-by to watch the drink being prepared.

A user selects a drink of his choice similarly to the pre process selection as described in processes **700** and **701**. Containers **320** may contain non-mixed or mixed ingredients. In vending apparatus **300**, some or all N containers **320** are connected to all M blenders. Hence, ingredients can be transferred to any blender.

Another embodiment of the invention will now be described with reference to **Figure 6** which is a schematic side view of a vending apparatus **400** for dispensing drinks containing small produce particles according to embodiments of the present invention, the drinks being mixed in the serving cup.

Vending apparatus **400** includes a housing **402** which contains:

a) a compartment **10** for holding dispensable cups **11**;

b) at least two containers **420**, each holding fresh produce product or produce pieces. Relevant produce products will be peeled off before filling the containers. A produce container may also be mixed with ice;

c) optionally, one or more containers **420** may hold a drink such as milk, yogurt, ice cream, orange juice, beverage, coffee, alcoholic drinks or any other liquid drink;

d) optionally, one or more containers **420** may hold other ingredients such as sugar, powder or liquid protein or any other ingredient for mixing purposes;

e) optionally, one or more containers **420** can hold water for cleaning purposes;

f) each produce container **420** is coupled with a blender (**30**, **40**, **50**) for cutting, grinding and/or crushing the produce into small particles. The blender includes a mechanism for pushing in the produce pieces;

g) mechanisms **445**, **446**, **447** and **441** for transferring the juices and small produce particles from blenders **30**, **40** and/or **50** and from liquid containers **321** into cup **11**;

h) optionally, a cleaning mechanism to clean each blender (**30**, **40**, **50**);

i) optionally, a pressing mechanism (**455**, **456**, **457**) for pushing produce items against the cutting mechanism;

j) optionally, a mechanism **470** for collecting from blender **30** produce waist such as peelings, seeds and other solid waist and pulp;

k) a dispensing compartment **480** for the customer to pick cup **11** with the drink he selected, when ready; and

l) a control panel **490** for the customer to operate the apparatus, which can be activated from the outside, normally by a customer who pays for the drink by coins, credit card, debit card, prepaid card, bank card, or by paper money or other cash.

Internal space **405** of vending apparatus **400** is at least partially refrigerated to preserve the freshness of the various ingredients, and some of internal space **405** can be a freezer. The front and other portions of housing **402** walls can optionally be made of clear material, such as glass, to allow the customer and passers-by to watch the drink being prepared.

The process of operating a vending apparatus **400** for dispensing drinks that contains fresh produce products will now be described with reference to **Figure 7**. **Figure 7** is a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus **400** as in **Figure 6**, according to embodiments of the present invention.

To operate vending apparatus **400**, available drinks or drink-shakes containing mixtures of produce products are displayed on massage screen payment control box **490**, in **steps 820** and **822**. A user starts process **800** of making a drink of his selection when the user goes through the preprocess steps of making the drink selection, the preprocess steps are finalized when the user makes a payment in **step 840**. Process **800** then proceeds automatically to produce the selected drink. Process **800** includes the following steps:

Preprocess steps:

Step 810 – The user selects a juice or a shake from available mixtures of produce products via payment control box **490**, which are displayed in **steps 820** and **822**.

Steps 821/823 – If the user selection is not in stock, an appropriate message is displayed in **step 830** and the user can make a new drink selection in **step 810**.

Step 840 – the user makes the payment via control box **490** or pushes a start button or any other mechanism a like.

Process steps:

Once payment is accepted by vending apparatus **400**, an automatic cycle of producing the selected drink begins.

Step 850 – a single cup **11** drops into dispensing compartment **480**.

Step 860 – each produce-product/produce-pieces selected in **step 810** is transferred from the produce container **425**, **426** and/or **427** into a coupling blender **30**, **40** and/or **50**, respectively. Each container **420** includes an opening mechanism (**435**, **436** and **437**) which operates to transfer the selected produce from the produce container **420** into the container coupled blender. For example, the opening mechanism may include a door that opens and the produce drops into the blender just below the container **420**.

Step 870 – each blender containing at least one produce. The blender grinds the produce into small particles, while mixing it with the liquid if added to the blender.

Step 875 – each blender optionally contains a waist removal mechanism operatively attached to a waist disposal **470**, to remove any produce waist from each blender, as needed.

Step 880 – the blended juice from each blender is transferred to serving cup **11** in dispensing compartment **480** by a transfer mechanism (**445**, **446** and **447**).

Step 890 – if selected, a measured amount of liquid, such as orange juice or beverage and the like is transferred from container **421** by transfer mechanism **441** to cup **11**. The liquid can be added a few seconds before the transfer of the juice from the blenders, along with the juice from the blenders or a few seconds after the juice from the blenders has been transferred. The client may need to open a door **482** in order to reach into compartment **480** and pick up cup **11** with the produced drink.

Step 895 – each blender is optionally cleaned by some cleaning mechanism, as needed. The cleaning mechanism may include a container **420** which is filled with cleaning liquid such as water, which washes the blenders and the waist is collected by waist removal mechanism **470**.

Step 899 – the vending apparatus **400** enters a wait state, ready for the next drink producing cycle.

In embodiments of the present invention, a container **420** may contain a mixture of produce products, for example, a mixture of bananas and strawberries, a mixture of bananas, melons and strawberries, a mixture of carrot pieces and apple pieces, a mixture of pineapple and melon pieces, a mixture of orange pieces and kiwi, and so on and so forth.

In embodiments of the present invention, a container **120** may contain a mixture of ingredients, for example, milk and sugar, orange juice and sugar, sugar and protein and so on and so forth.

Example 5:

A client selects a carrot, apple and orange juice drink. Container **425** contains carrot pieces and container **426** contains apples. Container **421** contains orange juice. Opening mechanisms **435** and **436** of containers **425** and **426** respectively, open-up for a preset period of time. Carrot pieces are transferred to blender **30** and apple(s) are transferred to blender **40.** Blender **30** is operated to grind carrot pieces and blender **40** is operated to grind apple pieces. After a preset period of time the juices from blenders **30** and **40** are transferred by corresponding transfer mechanism **445** and **446** to serving cup **11** in dispensing compartment **480**. Opening mechanism **431** opens up for a preset period of time and a pre measured amount of orange juice is also transferred by transfer mechanism **441** to serving cup **11**. The carrot, apple and orange juice is ready inside cup **11**.

Example 6:

A client selects a carrot and orange juice drink. Container **426** contains a mixture of carrot pieces and apple pieces. Container **421** contains orange juice. Opening mechanism **436** of container **426** respectively, opens up for a preset period of time, and a pre measured of apple pieces and carrot pieces are transferred to blender **30**. Blender **30** is operated to grind carrot pieces. After a preset period of time the carrot juice is transferred by a transfer mechanism **446** to serving cup **11** in dispensing compartment **480**. Opening mechanism **431** of container **421** opens up for a preset period of time and a pre measured amount of orange juice is also transferred by transfer mechanism **441** to serving cup **11**. The carrot and orange juice is ready inside cup **11**.

Another embodiment of the invention will now be described with reference to **FIG. 8** which is a schematic side view of a vending apparatus **500** for dispensing drinks containing small produce particles according to embodiments of the present invention, the drink being mixed by a blender **540**.

Vending apparatus **500** includes a housing **102** which contains:

a) a compartment **10** for holding dispensable cups **11**;

b) a cup moving mechanism to move cup **11** to different service stations of vending apparatus **500**, for example, a moving belt **570**.

c) at least one container assembly **520** with multiple containers for holding a produce or produce pieces or a mix of produce products. Relevant produce products will be peeled

off before filling the containers. A produce container may also be mixed with ice. Container assembly **520** can turn about its axis in direction **525**, such that a container with selected produce is positioned in alignment with cup **11**, for example, just above serving cup **11**;

d) at least one container assembly **530** with multiple containers for holding liquids such as milk, yogurt, ice cream, orange juice, beverage, coffee, alcoholic drinks or any other liquid drink. Container assembly **530** can turn about its axis in direction **535**, such that a container with selected liquid or ingredient is positioned in alignment with cup **11**, for example, just above serving cup **11**;

e) optionally, one or more containers of container assembly **530** may hold other ingredients such as sugar, powder or liquid protein, raisins or any other ingredient for mixing purposes;

f) optionally, one or more containers of container assembly **530** can hold water for cleaning purposes;

g) a blender **540** for cutting, grinding and/or crushing the produce into small particles, thereby producing a drinkable drink or shake. Blender **540** is operated by motor **542**;

h) optionally, a cleaning mechanism **550** for cleaning blender **540**;

i) optionally, a mechanism for moving the produce/produce-pieces into cup **11**;

j) a dispensing compartment **580** for the customer to pick cup **11** with the drink he selected, when ready. The compartment **580** may include a door **560** for cup **11** to enter compartment **580**; and

k) a control panel **590** for the customer to operate the apparatus, which can be activated from the outside, normally by a customer who pays for the drink by coins, credit card, debit card, prepaid card, bank card, or by paper money or other cash.

Internal space **505** of vending apparatus **500** is at least partially refrigerated to preserve the freshness of the various ingredients, and some of internal space **505** can be a freezer. The front and other portions of housing **502** walls can optionally be made of clear material, such as glass, to allow the customer and passers-by to watch the drink being prepared.

The process of operating a vending apparatus **500** for dispensing drinks that contains fresh produce products will now be described with reference to **Figure 9**. **Figure 9** is also a schematic flow diagram showing the successive steps taken, from purchasing till the delivery of a drink, performed on vending apparatus **500** as in **Figure 8**, according to embodiments of the present invention.

To operate vending apparatus **500**, available drinks or drink-shakes containing mixtures of produce products are displayed on massage screen payment control box **590**, in **steps 920** and **922**. A user starts process **900** of making a drink of his selection when the user goes through the preprocess steps of making the drink selection, the preprocess steps are finalized when the user makes a payment in **step 940**. Process **900** then proceeds automatically to produce the selected drink. Process **900** includes the following steps:

Preprocess steps:

Step 910 – The user selects a juice or a shake from available mixtures of produce products via payment control box **590**, which are displayed in **steps 920** and **922**.

Steps 921/923 – If the user selection is not in stock, an appropriate message is displayed in **step 930** and the user can make a new drink selection in **step 910**.

Step 940 – the user makes the payment via control box **590** or pushes a start button or any other mechanism a like.

Process steps:

Once payment is accepted by vending apparatus **500**, an automatic cycle of producing the selected drink begins.

Step 950 – a single cup **11** drops onto moving belt **570** (station **571**). Cup **11** is moved by moving belt **570** to next station, station **572**.

Step 960 – each produce-product/produce-pieces selected in **step 910** is transferred from the produce container **520a**, **520b**, **520c**, etc. into cup **11**. Container assembly **520** turns in direction **525** such that each container with selected produce is positioned in alignment with cup **11**, for example, just above serving cup **11**. Each container (**520a**, **520b**, **520c**, etc.) includes an opening mechanism **521**, which operates to transfer the selected produce from the selected produce container into cup **11**. For example, the opening mechanism **521** may include a door that opens and a pre measured quantity of the selected produce drops into cup **11**. Once all selected produce are in cup **11**, cup **11** is moved by moving belt **570** to next station, station **573**.

Step 970 – a measured amount of liquid, such as milk or orange juice and the like, is transferred from the liquid/ingredient container (**530a**, **530b**, **530c**, etc.) to cup **11**. Container assembly **530** turns in direction **535** such that each container with selected liquid/ingredient is positioned in alignment with cup **11**, for example, just above

serving cup **11**. Each container (**530a**, **530b**, **530c**, etc.) includes an opening mechanism **531**, which operates to transfer the selected liquid/ingredient from the selected liquid/ingredient container into cup **11**. For example, the opening mechanism **531** may include a door that opens and a pre measured amount of the selected liquid/ingredient drops into cup **11**. Once all selected liquid/ingredients are in cup **11**, cup **11** is moved by moving belt **570** to next station, station **574**.

Step 980 – blender **540** grinds the produce into small particles, while mixing the small particles with the liquid, if added to cup **11**. After a preset amount of time, cup **11** is moved by moving belt **570** to next station, station **575**, which is in dispensing compartment **580**.

Step 990 – the client may need to open a door **582** in order to reach into compartment **580** and pick up cup **11** with the produced drink or shake.

Step 995 – each blender is optionally cleaned by some cleaning mechanism, as needed. The cleaning mechanism may include a container in container assembly **530** or **520**, which is filled with cleaning liquid such as water, which enables washing blender **540**.

Step 999 – the vending apparatus **500** enters a wait state, ready for the next drink producing cycle.

In embodiments of the present invention, a container **520** may contain a mixture of produce products, for example, a mixture of bananas and strawberries, a mixture of bananas, melons and strawberries, a mixture of melons and strawberries, a mixture of carrot and apple, a mixture of pineapple and melon pieces, a mixture of orange pieces and kiwi, and so on and so forth.

In embodiments of the present invention, a container **520** may contain a mixture of ingredients, for example, milk and sugar, orange juice and sugar, sugar and protein and so on and so forth.

Example 7:

A client selects a Banana Strawberry shake based on milk and sugar. Container **520a** contains strawberries and container **520b** contains banana pieces. Container **530a** contains milk and container **530b** contains sugar. Once cup **11** is in station **572**, container assembly **520** turns such that the container holding strawberries is positioned in alignment with cup **11**, for example, just above serving cup **11**. Opening mechanism **521** opens up for a preset period of time and

strawberries are transferred into cup **11**. Container assembly **520** turns such that the container holding banana pieces is positioned in alignment with cup **11**, for example, just above serving cup **11**. Opening mechanism **521** opens up for a preset period of time and banana pieces are transferred into cup **11**. Cup **11** is moved by moving belt **570** to station **573**.

Container assembly **530** turns such that the container holding milk is positioned in alignment with cup **11**, for example, just above serving cup **11**. Opening mechanism **531** opens up for a preset period of time and milk is transferred into cup **11**. Container assembly **530** turns such that the container holding sugar is positioned in alignment with cup **11**, for example, just above serving cup **11**. Opening mechanism **531** opens up for a preset period of time and sugar is transferred into cup **11**. Cup **11** is moved by moving belt **570** to station **574**.

Blender **540** is operated to move (in direction **545**) into cup **11**, grind and blend the mixtures in cup **11**. After a preset period of time, cup **11** is moved into dispensing compartment **580** by moving belt **570**. The banana strawberry shake is ready inside cup **11**.

Example 8:

A client selects a Banana Strawberry shake based on milk and sugar. Container **520a** contains a mixture of banana pieces and strawberries. Container **530a** contains milk and sugar. Once cup **11** is in station **572**, container assembly **520** turns such that container **520a** is positioned in alignment with cup **11**, for example, just above serving cup **11**. Opening mechanism **521** opens up for a preset period of time and the mixture of banana pieces and strawberries is transferred into cup **11**. Cup **11** is moved by moving belt **570** to station **573**.

Container assembly **530** turns such that the container holding milk and sugar is positioned in alignment with cup **11**, for example, just above serving cup **11**. Opening mechanism **531** opens up for a preset period of time and the mixture of milk and sugar is transferred into cup **11**. Cup **11** is moved by moving belt **570** to station **574**.

Blender **540** is operated to move (in direction **545**) into cup **11**, grind and blend the mixtures in cup **11**. After a preset period of time, cup **11** is moved into dispensing compartment **580** by moving belt **570**. The banana strawberry shake is ready inside cup **11**.

In another embodiment of the present invention, station **574** precedes station **573**. Hence lender **540** is operated to move (in direction **545**) into cup **11**, grind and blend the mixture of produce only that is in cup **11**. Cup **11** is then moved by moving belt **570** to station **573**. Container assembly **530** turns such that the container holding milk and sugar is positioned in

alignment with cup **11**, for example, just above serving cup **11**. Opening mechanism **531** opens up for a preset period of time and the mixture of milk and sugar is transferred into cup **11**. Cup **11** is moved by moving belt **570** to a station where the juice mixture in cup **11** is mixed. Cup **11** is then moved into dispensing compartment **580** by moving belt **570**. The banana strawberry shake is ready inside cup **11**.

In another embodiment of the present invention, containers **520** and **530** of vending apparatus **500** are merged into a single container that includes compartments for all types of ingredients.

In another embodiment of the present invention, container **10** and container assemblies **520** and **530** of vending apparatus **500** are merged into a single container assembly that includes compartments for all types of ingredients, as well as a special compartment for cups **11**.

Another embodiment of the invention will now be described with reference to **Figure 10** which is a schematic side view of a vending apparatus **501** for dispensing drinks containing small produce particles according to embodiments of the present invention, the drink being mixed by a blender **541**.

Vending apparatus **501** includes a housing **503** which contains:

a) a compartment for holding dispensable cups **11**;

b) at least one container assembly **523** with multiple containers for holding a produce or produce pieces or a mix of produce products. Relevant produce products will be peeled off before filling the containers. A produce container may also be mixed with ice. Container assembly **523** can turn about its axis in direction **526**, such that a container with selected produce is positioned in alignment with blender **541**, for example, just above blender **541**;

c) optionally, one or more containers of container assembly **523** may hold liquids such as milk, yogurt, ice cream, orange juice, beverage, coffee, alcoholic drinks or any other liquid drink.

d) optionally, one or more containers of container assembly **523** may hold other ingredients such as sugar, powder or liquid protein, raisins or any other ingredient for mixing purposes;

e) optionally, one or more containers of container assembly **523** can hold water for cleaning purposes;

f) a blender **541** for cutting, grinding and/or crushing the produce into small particles, thereby producing a drinkable drink or shake;

g) optionally, a cleaning mechanism for cleaning blender **541**;

h) optionally, a mechanism for moving the produce/produce-pieces from a selected container of container assembly **523** into blender **541**;

i) a mechanism for moving the blended juice from blender **541** into cup **11.** For example, blender **541** turns over in direction **546** and the drink/shake is pored into cup **11**;

j) a cup moving mechanism to move cup **11** from a mixing station to the dispensing compartment **580**, for example, a moving belt **570**.

k) a dispensing compartment **580** for the customer to pick cup **11** with the drink he selected, when ready. The compartment **580** may include a door **560** for cup **11** to enter compartment **580**; and

l) a control panel **590** for the customer to operate the apparatus, which can be activated from the outside, normally by a customer who pays for the drink by coins, credit card, debit card, prepaid card, bank card, or by paper money or other cash.

Yet another embodiment of vending apparatus **500**, according to embodiments of the present invention, is illustrated in **Figure 11.** The containers of container assemble **527**, which hold produce products, include at the bottom the container a blender **549**. Container assembly **527** can turn about its axis such that a selected container with selected produce is positioned in alignment with cup **11**, for example, just above serving cup **11**. The blender **549** of the selected container grinds the produce into small particles, which can be small enough to be drinkable or may need more crushing or cutting by a blender **547**. The blended produce is dropped into cup **11**. The next container is selected, the produce in the selected container is grinded and the blended produce is dropped into cup **11**. Liquid is added to cup **11** and the mixture is mixed by mixer **547** into a drink/shake.

In still another embodiment of vending apparatus **500**, according to embodiments of the present invention, the ingredients will not drop into cup **11** but rather be picked by a picker, such as an arm with a grabbing mechanism, from a selected compartment into the cup **11** or blender compartment.

In yet another embodiment of vending apparatuses **100**, **200**, **300**, **400**, and **501**, according to embodiments of the present invention, instead of cup **11** a bottle is filled with the juice produced. Optionally, the bottle can be plugged by a plugging mechanism.

In another embodiment of vending apparatus **501**, according to embodiments of the present invention, the ingredients will not drop into blender **541** but rather be picked by a picker, such as an arm with a grabbing mechanism, from a selected compartment into blender **541**.

Another embodiment of the invention will now be described with reference to **Figure 12** which is a schematic side view of a vending apparatus for dispensing drinks containing small produce particles according to embodiments of the present invention. Containers **620** of the vending apparatus contain produce/produce-pieces, which are pushed upwards by some pushing mechanism **640**, for example a piston, into the cup **11**. Container **620** has some slope towards cup **11**. Each container can turn in direction **612** towards cup **11** or the cup **11** can move towards the selected container **620**, in a carousel mechanism, for example. Each container **620** can hold one or more ingredients.

In embodiments of the present invention the dispensed cup can be replaced by a bottle, which can be optionally plugged when filled with the produced drink.

The invention being thus described in terms of the embodiments and examples, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

WHAT IS CLAIMED IS:

1. A vending apparatus for dispensing drinks containing small produce particles having an enclosed housing, said housing comprising:

a) a mechanism for dispensing a cup;

b) at least one produce container, said produce container can hold one or more produce items or produce pieces;

c) at least one liquid container, said liquid container can hold one or more kinds of drinkable liquids;

d) at least one mechanism for cutting, grinding and/or crushing the produce or produce pieces;

e) a mechanism for transferring the produce or produce pieces from said produce container to said at least one cutting mechanism;

f) a mechanism for transferring the small produce particles and juice from said at least one cutting mechanism to said dispensed cup;

g) a compartment where said dispensed cup is filled with the drink produced can picked up; and

h) a controller for automatically initiate the drink preparation in response to a customer's selection.

2. The vending apparatus of claim 1, wherein said drinkable liquid is selected from the group of liquids including milk, ice cream, yogurt, orange juice, beverage, coffee, alcoholic drinks, liquid protein, any kind of juice, any kind of dairy product.

3. The vending apparatus of claim 1, wherein said at least one liquid container contain a food ingredient selected from the group including sugar, powder protein, chocolate, candies.

4. The vending apparatus of claims 1 and 3, wherein said at least one liquid container contains mixture of said drinkable liquid and said food ingredient.

5. The vending apparatus of claim 1, wherein said at least one liquid container contains water or other cleaning liquids.

6. The vending apparatus of claim 1, wherein said at least one produce container contains a mixture of produce items.

7. The vending apparatus of claim 1, wherein said at least one produce container contains a mixture of produce pieces.

8. The vending apparatus of claim 1, wherein said at least one produce container contains a mixture of produce items and at least one food ingredient, the food ingredient selected from the group including sugar, powder protein, chocolate, candies.

9. The vending apparatus of claim 1, wherein said at least one cutting mechanism is coupled with one of said at least one produce container;

10. The vending apparatus of claim 1, wherein said at least one cutting mechanism is selected from the group including a blender, a mixer, a grinder.

11. The vending apparatus of claim 1, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a door that opens up for a preset period of time.

12. The vending apparatus of claim 11, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a door that opens up for a preset period of time and a pipe that leads from the lower end of said produce container to upper end of said cutting mechanism.

13. The vending apparatus of claim 1, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a picker.

14. The vending apparatus of claim 1, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a pushing mechanism, wherein said pushing mechanism pushes said produce upwards by some pushing mechanism, such as a piston, into said cutting mechanism.

15. The vending apparatus of claim 1, wherein said mechanism for transferring the small produce particles and juice from said cutting mechanism to said dispensed cup is a pipe.

16. The vending apparatus of claim 1, wherein at least a portion of the internal space of said housing is refrigerated.

17. The vending apparatus of claim 1, wherein at least a portion of the internal space of said housing is a freezer.

18. A vending apparatus for dispensing drinks containing small produce particles having an enclosed housing, said housing comprising:

a) a mechanism for dispensing a cup;

b) at least two produce containers, said produce containers can hold one or more produce items or produce pieces;

c) at least one mechanism for cutting, grinding and/or crushing the produce or produce pieces;

d) a mechanism for transferring the produce or produce pieces from said produce container to said at least one cutting mechanism;

e) a mechanism for transferring the small produce particles and juice from said at least one cutting mechanism to said dispensed cup;

f) a compartment where said dispensed cup is filled with the drink produced can picked up; and

g) a controller for automatically initiate the drink preparation in response to a customer's selection.

19. The vending apparatus of claim 18, further comprising:

h) at least one liquid container, said liquid container can hold one or more kinds of drinkable liquids; and

i) a mechanism for transferring the juice from said at least one liquid container to said dispensed cup;

20. The vending apparatus of claim 19, wherein said drinkable liquid is selected from the group of liquids including milk, ice cream, yogurt, orange juice, beverage, coffee, alcoholic drinks, liquid protein, any kind of juice, any kind of dairy product.

21. The vending apparatus of claim 19, wherein said at least one liquid container contain a food ingredient selected from the group including sugar, powder protein, chocolate, candies.

22. The vending apparatus of claims 19 and 21, wherein said at least one liquid container contains mixture of said drinkable liquid and said food ingredient.

23. The vending apparatus of claim 19, wherein said at least one liquid container contains water or other cleaning liquids.

24. The vending apparatus of claim 19, wherein said at least one produce container contains a mixture of produce items.

25. The vending apparatus of claim 18, wherein said at least one produce container contains a mixture of produce pieces.

26. The vending apparatus of claim 18, wherein said at least one produce container contains a mixture of produce items and at least one food ingredient, the food ingredient selected from the group including sugar, powder protein, chocolate, candies.

27. The vending apparatus of claim 18, wherein said at least one cutting mechanism is coupled with one of said at least one produce container;

28. The vending apparatus of claim 18, wherein said at least one cutting mechanism is selected from the group including a blender, a mixer, a grinder.

29. The vending apparatus of claim 18, wherein said at least one cutting mechanism further comprises a pressing mechanism for pushing produce items against said cutting mechanism;

30. The vending apparatus of claim 18, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a door that opens up for a preset period of time.

31. The vending apparatus of claim 30, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a door that opens up for a preset period of time and a pipe that leads from the lower end of said produce container to upper end of said cutting mechanism.

32. The vending apparatus of claim 18, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a picker.

33. The vending apparatus of claim 18, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a pushing mechanism, wherein said pushing mechanism pushes said produce upwards by some pushing mechanism, such as a piston, into said cutting mechanism.

34. The vending apparatus of claim 18, wherein said mechanism for transferring the small produce particles and juice from said cutting mechanism to said dispensed cup is a pipe.

35. The vending apparatus of claim 18, wherein at least a portion of the internal space of said housing is refrigerated.

36. The vending apparatus of claim 18, wherein at least a portion of the internal space of said housing is a freezer.

37. A method for producing drinks from produce items performed by a vending apparatus as in claims 1and 18, the method comprising the steps of:

a) providing the user with a selecting procedure to select the drink that is to be produced and delivered to the user, thereby identifying the selected drink;
b) dispensing a cup to be filled with said selected drink;
c) transferring selected produce or produce pieces to said at least one cutting mechanism;
d) transferring selected base drinks to said at least one cutting mechanism;
e) cutting, crushing and blending the produce or produce pieces said at least one cutting mechanism, thereby producing small produce particles and produce juice;
f) transferring said the small produce particles and produce juice to said dispensed cup; and
g) deliver the drink to the customer.

38. A method for producing drinks from produce items performed by a vending apparatus as in claims 1and 18, the method comprising the steps of:

a) providing the user with a selecting procedure to select the drink that is to be produced and delivered to the user, thereby identifying the selected drink;
b) dispensing a cup to be filled with said selected drink;
c) transferring selected produce or produce pieces to said at least one cutting mechanism;
d) cutting, crushing and blending the produce or produce pieces said at least one cutting mechanism, thereby producing small produce particles and produce juice;
e) transferring said the small produce particles and produce juice to said dispensed cup;
f) transferring selected base drinks to said dispensed cup; and
g) deliver the drink to the customer.

39. A vending apparatus for dispensing drinks containing small produce particles having an enclosed housing, said housing comprising:

a) a mechanism for dispensing a cup;
b) a mechanism for moving said dispensed cup;
c) at least one produce container, said produce container comprising compartments, each of which can hold one or more produce items or produce pieces;
d) at least one liquid container, said liquid container comprising compartments, each of which can hold one or more kinds of drinkable liquids;
e) at least one mechanism for cutting, grinding and/or crushing the produce or produce pieces;
f) a mechanism for transferring the produce or produce pieces from said produce container to said at least one cutting mechanism;
g) a mechanism for transferring the small produce particles and juice from said at least one cutting mechanism to said dispensed cup;
h) a compartment where said dispensed cup is filled with the drink produced can picked up; and
i) a controller for automatically initiate the drink preparation in response to a customer's selection.

40. The vending apparatus of claim 39, wherein said drinkable liquid is selected from the group of liquids including milk, ice cream, yogurt, orange juice, beverage, coffee, alcoholic drinks, liquid protein, any kind of juice, any kind of dairy product.

41. The vending apparatus of claim 39, wherein said at least one compartment of said liquid container contain a food ingredient selected from the group including sugar, powder protein, chocolate, candies.

42. The vending apparatus of claims 39 and 41, wherein said at least one compartment of said liquid container contains mixture of said drinkable liquid and said food ingredient.

43. The vending apparatus of claim 39, wherein said at least one compartment of said liquid container contains water or other cleaning liquids.

44. The vending apparatus of claim 39, wherein said at least one compartment of said produce container contains a mixture of produce items.

45. The vending apparatus of claim 39, wherein said at least one compartment of said produce container contains a mixture of produce pieces.

46. The vending apparatus of claim 39, wherein said at least one compartment of said produce container contains a mixture of produce items and at least one food ingredient, the food ingredient selected from the group including sugar, powder protein, chocolate, candies.

47. The vending apparatus of claim 39, wherein said at least one cutting mechanism is aligned with one of said compartments of said produce container;

48. The vending apparatus of claim 39, wherein said at least one cutting mechanism is selected from the group including a blender, a mixer, a grinder.

49. The vending apparatus of claim 39, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a door that opens up for a preset period of time.

50. The vending apparatus of claim 49, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a door that opens up for a preset period of time and a pipe that leads from the lower end of said produce container to upper end of said cutting mechanism.

51. The vending apparatus of claim 39, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a picker.

52. The vending apparatus of claim 39, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a pushing mechanism, wherein said pushing mechanism pushes said produce upwards by some pushing mechanism, such as a piston, into said cup.

53. The vending apparatus of claim 39, wherein at least a portion of the internal space of said housing is refrigerated.

54. The vending apparatus of claim 39, wherein at least a portion of the internal space of said housing is a freezer.

55. The vending apparatus of claims 1, 18 and 39, further comprising a cleaning mechanism for cleaning one or more of said at least one cutting mechanism.

56. The vending apparatus of claims 1, 18 and 39, further comprising a mechanism for collecting waist from one or more of said at least one cutting mechanism.

57. The vending apparatus of claim 56, wherein said mechanism for collecting waist collects waist selected from the group including peelings, seeds, pulp, other solid waist.

58. The vending apparatus of claim 39, wherein said at least one compartment of said produce container further comprise a cutting mechanism for cutting the produce items as they leave the compartment.

59. The vending apparatus of claim 39, wherein said mechanism for moving said dispensed cup is a moving belt.

60. A method for producing drinks from produce items performed by a vending apparatus as in claim 39, the method comprising the steps of:

a) providing the user with a selecting procedure to select the drink that is to be produced and delivered to the user, thereby identifying the selected drink;
b) dispensing a cup to be filled with said selected drink onto a cup moving mechanism;
c) transferring selected produce or produce pieces to said dispensed cup;
d) transferring selected base drinks to said dispensed cup;
e) cutting, crushing and blending the produce or produce pieces said at least one cutting mechanism, thereby producing small produce particles and produce juice, and mixing said small produce particles and produce juice with said base drink; and
f) deliver the drink to the customer.

61. A method for producing drinks from produce items performed by a vending apparatus as in claim 39, the method comprising the steps of:

a) providing the user with a selecting procedure to select the drink that is to be produced and delivered to the user, thereby identifying the selected drink;
b) dispensing a cup to be filled with said selected drink onto a cup moving mechanism;
c) transferring selected produce or produce pieces to said dispensed cup;
d) cutting, crushing and blending the produce or produce pieces said at least one cutting mechanism, thereby producing small produce particles and produce juice;
e) transferring selected base drinks to said dispensed cup;
f) mixing said small produce particles and produce juice with said base drink; and
g) deliver the drink to the customer.

62. A vending apparatus for dispensing drinks containing small produce particles having an enclosed housing, said housing comprising:

a) a mechanism for dispensing a cup;
b) a mechanism for moving said dispensed cup;
c) a container, said container comprising compartment;
d) a mechanism for cutting, grinding and/or crushing produce items or produce pieces;
e) a mechanism for transferring ingredients from said container to said cutting mechanism;
f) a mechanism for transferring the small produce particles and juice from said at least one cutting mechanism to said dispensed cup;

g) a compartment where said dispensed cup is filled with the drink produced can picked up; and

h) a controller for automatically initiate the drink preparation in response to a customer's selection.

63. The vending apparatus of claim 62, wherein said ingredients are selected from the group including produce items, produce pieces, milk, ice cream, yogurt, orange juice, beverage, coffee, alcoholic drinks, liquid protein, any kind of juice, any kind of dairy product, sugar, powder protein, chocolate, candies.

64. The vending apparatus of claims 39 and 62, wherein said produce container can turn on produce container axis.

65. The vending apparatus of claims 39 and 62, wherein said liquid container can turn on liquid container axis.

66. The vending apparatus of claims 62 and 63, wherein said at least one compartment of said container contains mixture of said ingredients.

67. The vending apparatus of claim 62, wherein said at least one compartment of said liquid container contains water or other cleaning liquids.

68. The vending apparatus of claim 62, wherein said cutting mechanism is aligned with one of said compartments of said container;

69. The vending apparatus of claim 62, wherein said cutting mechanism is selected from the group including a blender, a mixer, a grinder.

70. The vending apparatus of claim 62, wherein said mechanism for transferring ingredients from said container to said cutting mechanism is a door that opens up for a preset period of time.

71. The vending apparatus of claim 62, wherein said mechanism for transferring ingredients from said container to said cutting mechanism is a door that opens up for a preset period of time and a pipe that leads from the lower end of said produce container to upper end of said cutting mechanism.

72. The vending apparatus of claim 62, wherein said mechanism for transferring ingredients from said container to said cutting mechanism is a picker.

73. The vending apparatus of claims 13, 32, 51 and 72, wherein said picker is a moving arm comprising a grabbing mechanism.

74. The vending apparatus of claim 62, wherein said mechanism for transferring the produce or produce pieces from said produce container to said cutting mechanism is a pushing mechanism, wherein said pushing mechanism pushes said produce upwards by some pushing mechanism, such as a piston, into said cup.

75. The vending apparatus of claim 62, wherein at least a portion of the internal space of said housing is refrigerated.

76. The vending apparatus of claim 62, wherein at least a portion of the internal space of said housing is a freezer.

77. The vending apparatus of claims 1, 18, 39 and 62, wherein at least a portion of at least one wall of said housing, is made of clear materials, and thereby transmitting substantially all wave length of light through said clear housing walls.

78. The vending apparatus of claims 1, 18 and 62, wherein said dispensed cup is a bottle.

79. The vending apparatus of claim 62, further comprising:

i) a cleaning mechanism for cleaning said cutting mechanism.

80. The vending apparatus of claim 62, further comprising:

j) a mechanism for collecting waist from said cutting mechanism.

81. The vending apparatus of claim 80, wherein said mechanism for collecting waist collects waist selected from the group including peelings, seeds, pulp, other solid waist.

82. The vending apparatus of claim 62, wherein said at least one compartment of said container further comprise a cutting mechanism for cutting the produce items as they leave the compartment.

83. The vending apparatus of claim 62, wherein said mechanism for moving said dispensed cup is a moving belt.

84. The vending apparatus of claim 62, wherein said mechanism for dispensing a cup is part of said container.

85. A method for producing drinks from produce items performed by a vending apparatus as in claim 62, the method comprising the steps of:

a) providing the user with a selecting procedure to select the drink that is to be produced and delivered to the user, thereby identifying the selected drink;
b) dispensing a cup to be filled with said selected drink onto a cup moving mechanism;
c) moving said cup to a drink collecting location;
d) transferring selected produce or produce pieces to said cutting mechanism;
e) transferring selected base drinks to said cutting mechanism;
f) cutting, crushing and blending the produce or produce pieces said at least one cutting mechanism, thereby producing small produce particles and produce juice, and mixing said small produce particles and produce juice with said base drink;
g) transferring said produced drink to said dispensed cup; and
h) deliver said dispensed cup with said produced drink to the customer.

86. A method for producing drinks from produce items performed by a vending apparatus as in claim 62, the method comprising the steps of:

a) providing the user with a selecting procedure to select the drink that is to be produced and delivered to the user, thereby identifying the selected drink;
b) dispensing a cup to be filled with said selected drink onto a cup moving mechanism;
c) transferring selected produce or produce pieces to said dispensed cup;
d) transferring selected base drinks to said dispensed cup;
e) moving said cup to the cutting mechanism location;
f) cutting, crushing and blending the produce or produce pieces said at least one cutting mechanism, thereby producing small produce particles and produce juice, and mixing said small produce particles and produce juice with said base drink;
g) deliver said dispensed cup with said produced drink to the customer.

87. A method for producing drinks from produce items performed by a vending apparatus as in claim 82, the method comprising the steps of:

a) providing the user with a selecting procedure to select the drink that is to be produced and delivered to the user, thereby identifying the selected drink;
b) dispensing a cup to be filled with said selected drink onto a cup moving mechanism;
c) moving said cup to a drink collecting location;
d) transferring selected produce or produce pieces to said cutting mechanism;
e) cutting, crushing and blending the produce or produce pieces said at least one cutting mechanism, thereby producing small produce particles and produce juice;
f) transferring selected base drinks to said dispensed cup;
g) mixing said small produce particles and produce juice with said base drink, thereby producing the produced drink as selected by the user;
h) transferring said produced drink to said dispensed cup; and
i) deliver said dispensed cup with said produced drink to the customer.

88. The method of claims 37, 38, 60, 61, 85 and 87, further comprising the step of cleaning said at least one cutting mechanism.

89. The method of claims 37, 38, 60, 61, 85 and 87, further comprising the step of removing said waist from said at least one cutting mechanism.

90. The method of claims 37, 38, 60, 61, 85 and 87, wherein said selecting procedure comprising the step of:

a) displaying the drinks menu to the user;
b) if a selected drink is not available, displaying a message to the user;
c) if a selected drink is available, displaying the cost to the user;
d) accepting payment from the user; and
e) initiating the drink production, said initiation includes identifying and selecting the containers containing produce and base drink according to the user selection, selecting the cutting mechanism to be used.

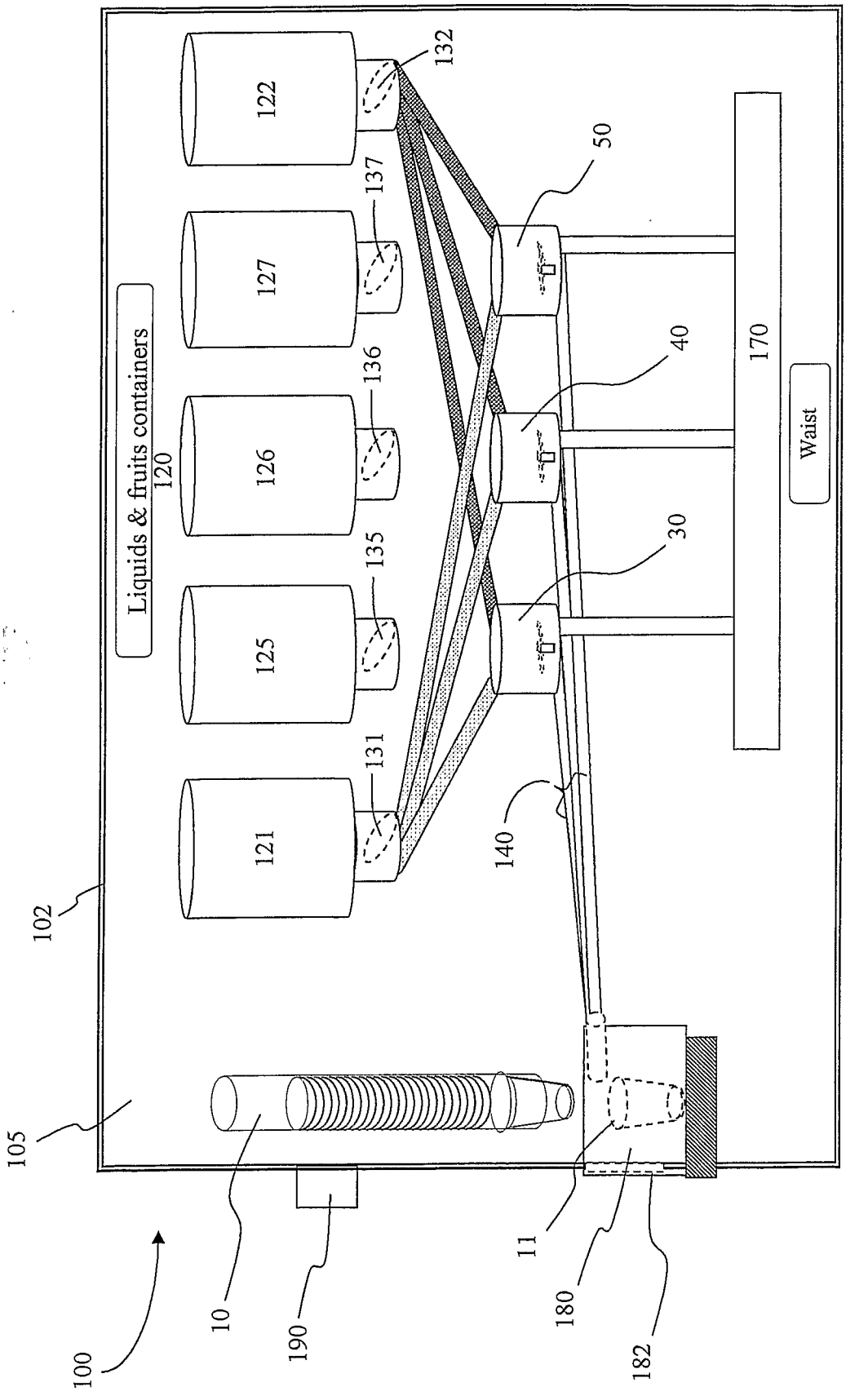

Liquids & fruits containers
120
121
122
125
126
127
131
132
135
136
137
140
50
40
30
170
Waist
102
105
100
10
190
11
180
182

Fig. 1

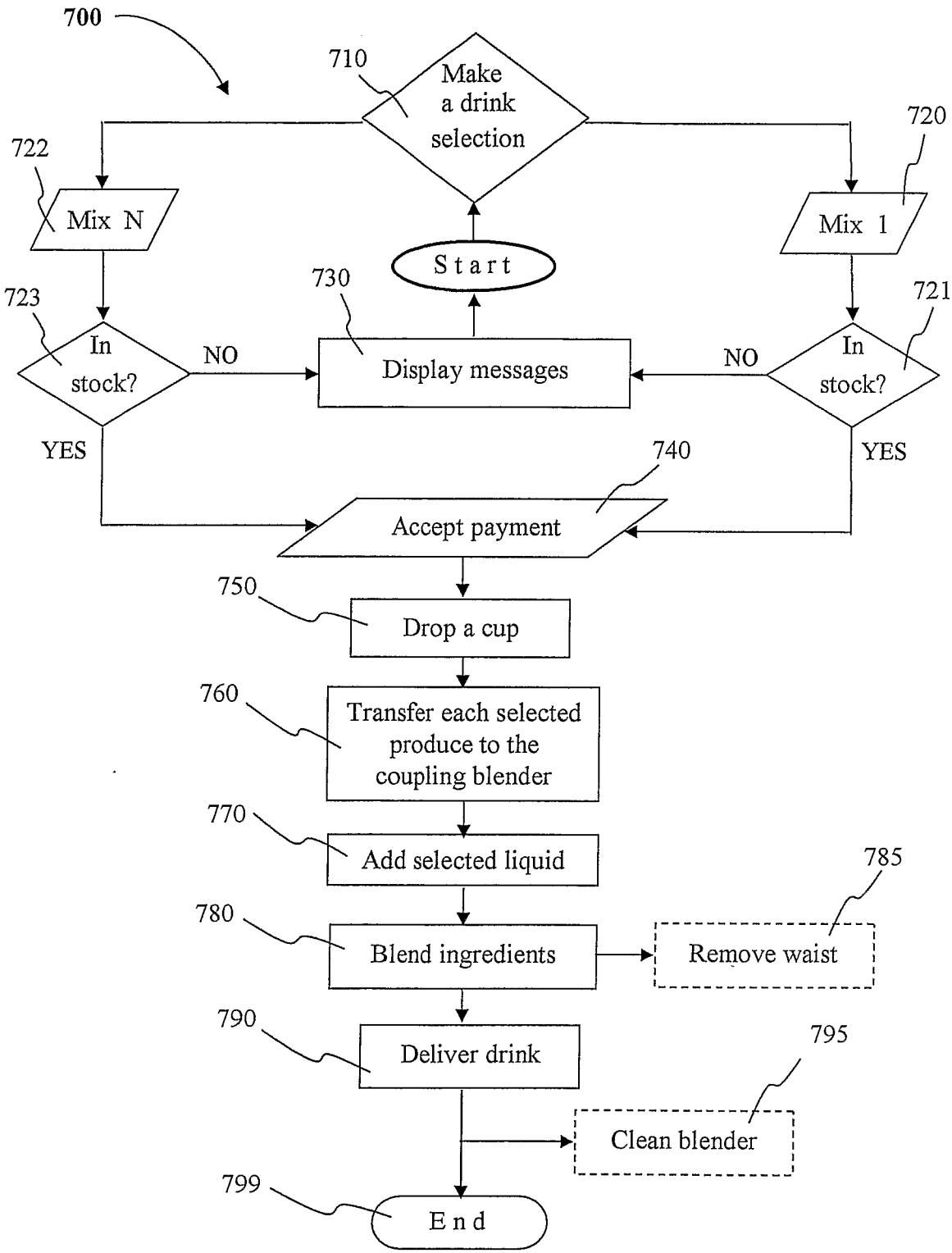

700
710
Make a drink selection
720
722
Mix N
Mix 1
Start
730
723
721
In stock?
NO
Display messages
NO
In stock?
YES
YES
740
Accept payment
750
Drop a cup
760
Transfer each selected produce to the coupling blender
770
Add selected liquid
785
780
Blend ingredients
Remove waist
790
Deliver drink
795
Clean blender
799
End

Fig. 2

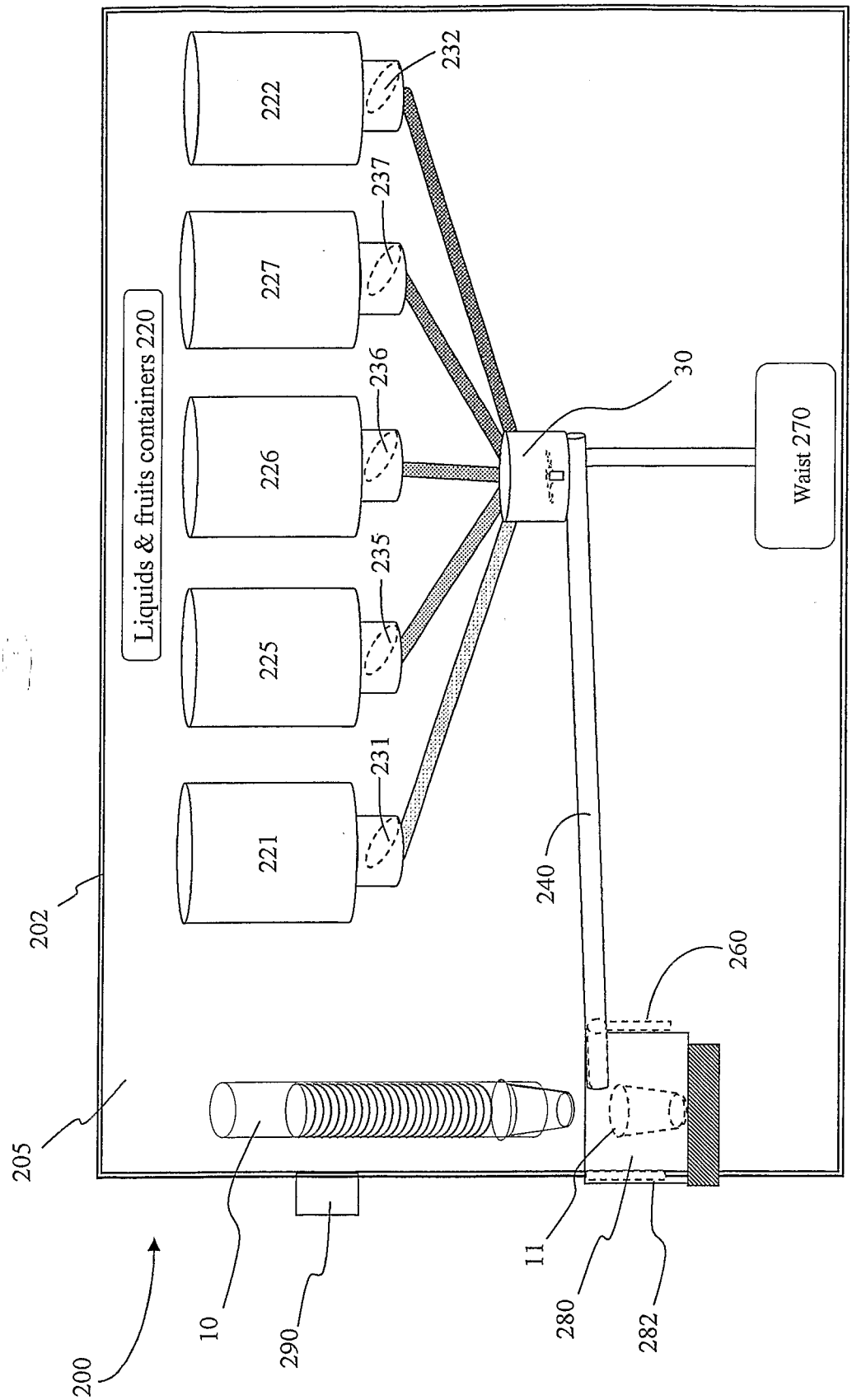

Liquids & fruits containers 220
222
227
226
225
221
232
237
236
235
231
30
Waist 270
240
260
202
205
200
10
290
11
280
282

Fig. 3

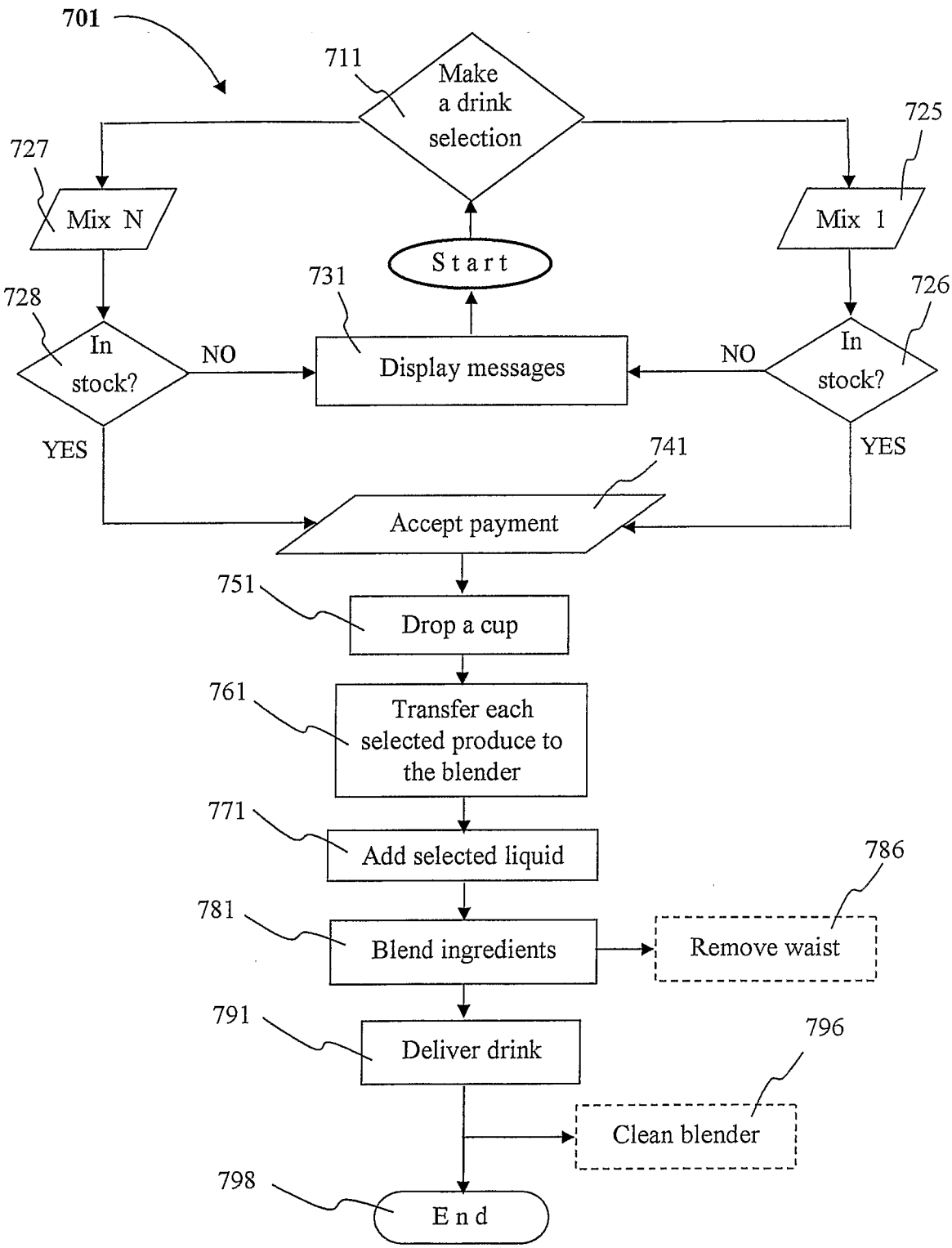

701
711
Make a drink selection
725
727
Mix N
Mix 1
Start
731
726
728
In stock?
NO
Display messages
NO
In stock?
YES
YES
741
Accept payment
751
Drop a cup
761
Transfer each selected produce to the blender
771
Add selected liquid
786
781
Blend ingredients
Remove waist
791
Deliver drink
796
Clean blender
798
End

Fig. 4

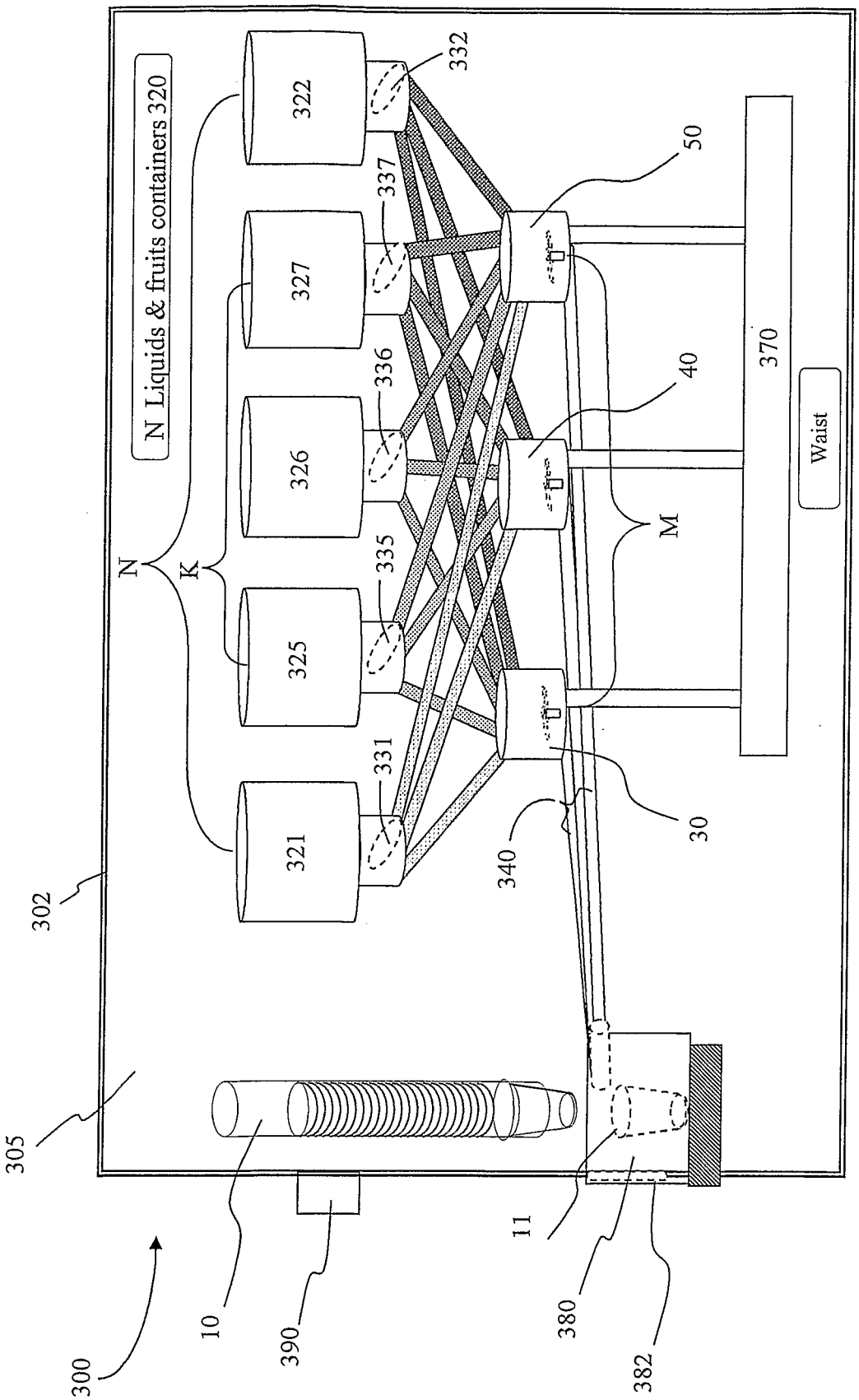

N Liquids & fruits containers 320
322
327
326
325
321
332
337
336
335
331
50
40
30
370
Waist
N
K
M
340
302
305
300
10
390
11
380
382

Fig. 5

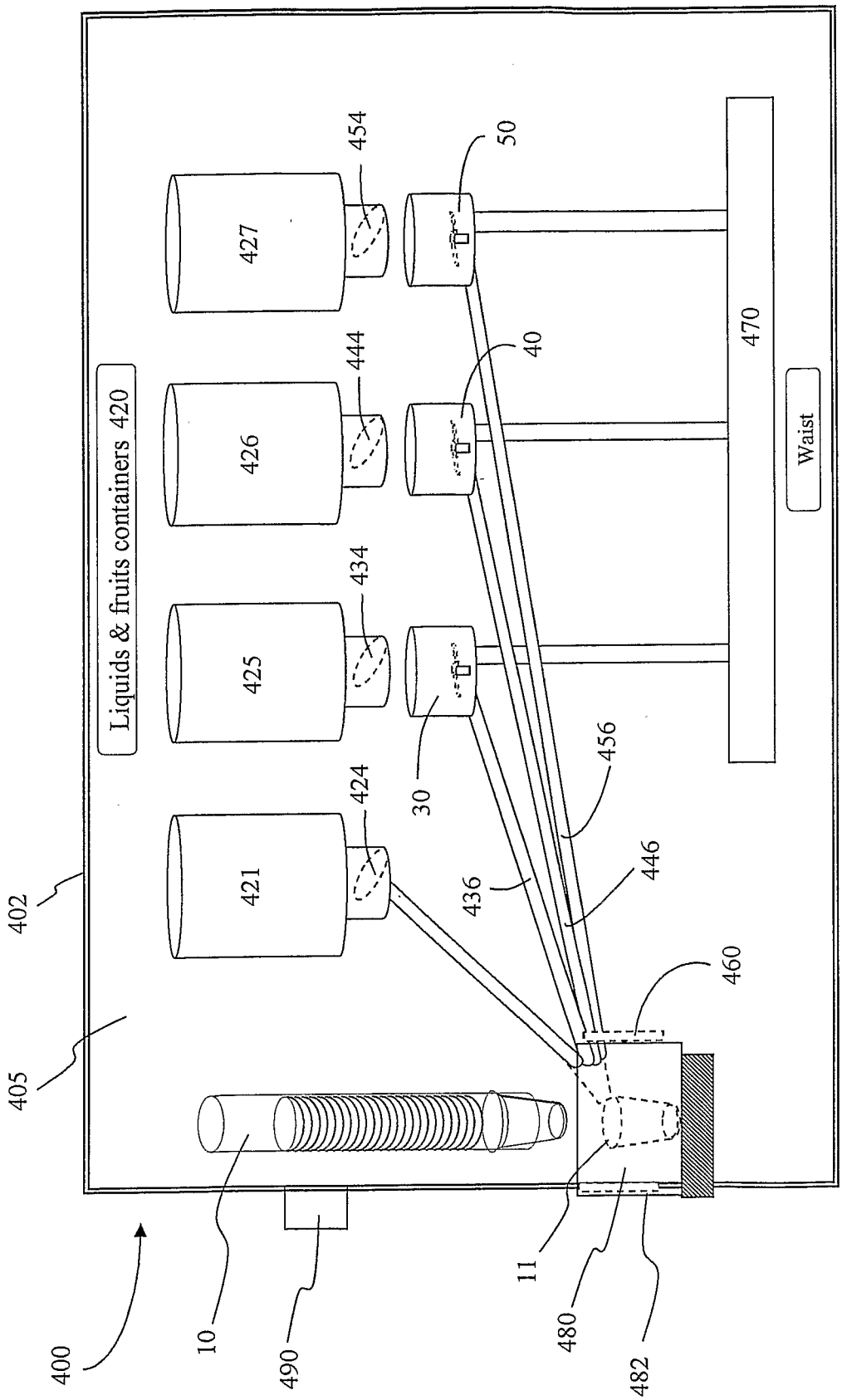

Liquids & fruits containers 420
427
426
425
421
454
444
434
424
50
40
30
470
Waist
456
446
436
460
402
405
400
10
490
11
480
482

Fig. 6

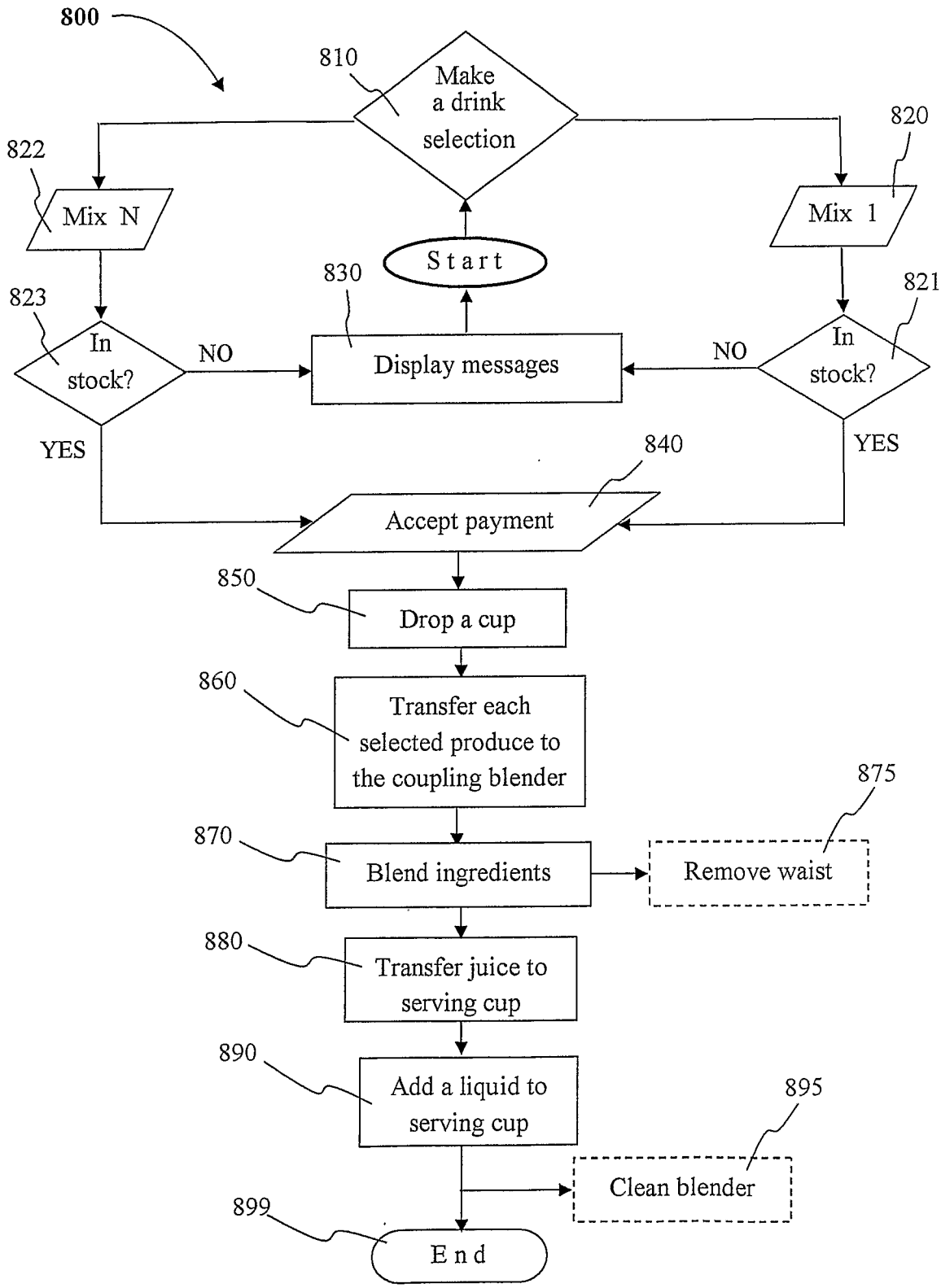

800
810
Make a drink selection
820
822
Mix N
Mix 1
Start
830
821
823
In stock?
NO
Display messages
NO
In stock?
YES
YES
840
Accept payment
850
Drop a cup
860
Transfer each selected produce to the coupling blender
875
870
Blend ingredients
Remove waist
880
Transfer juice to serving cup
890
Add a liquid to serving cup
895
Clean blender
899
E n d

Fig. 7

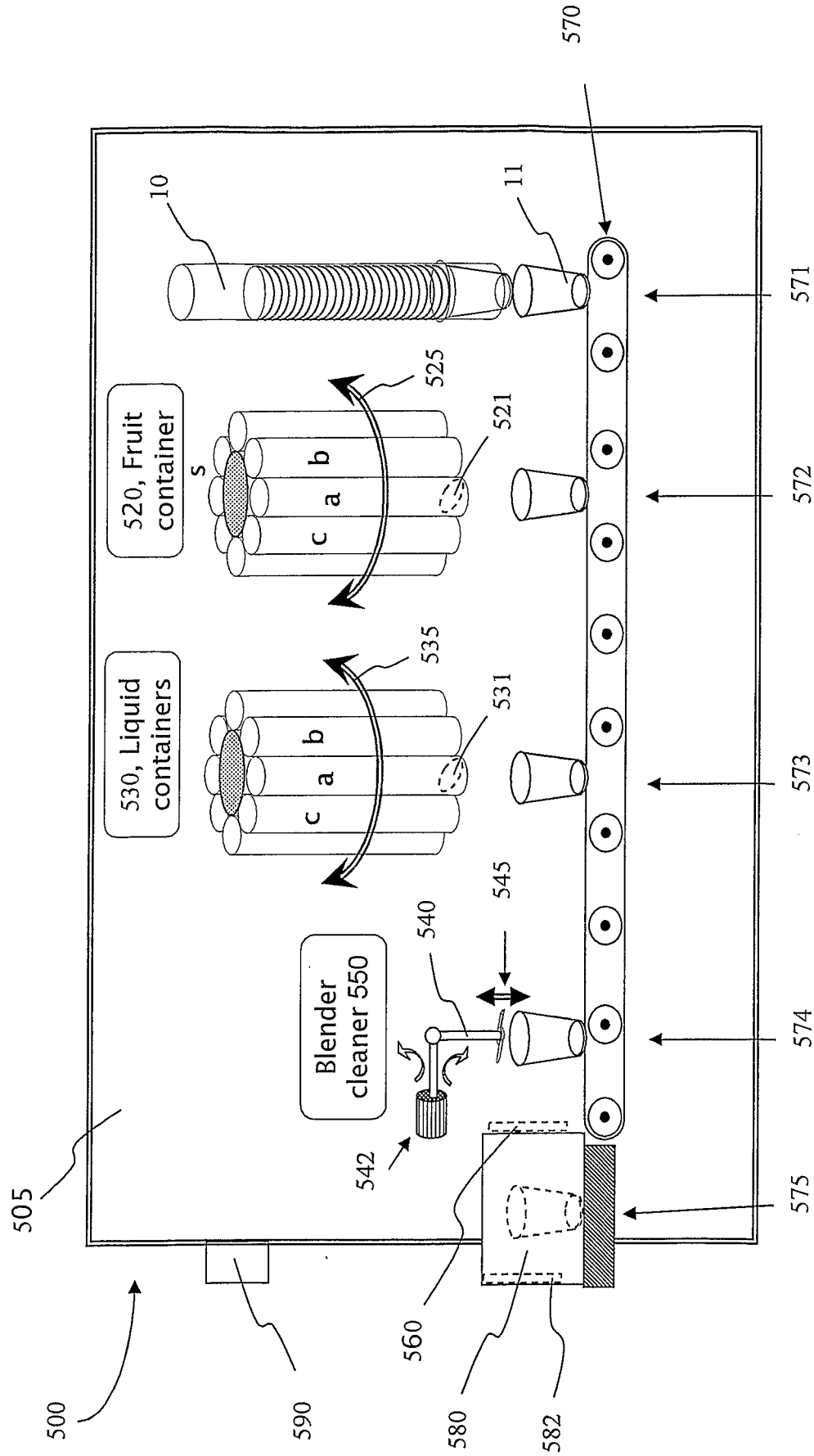

570
10
11
571
525
520, Fruit container
521
572
535
530, Liquid containers
531
573
545
540
Blender cleaner 550
574
542
575
505
500
590
560
580
582

Fig. 8

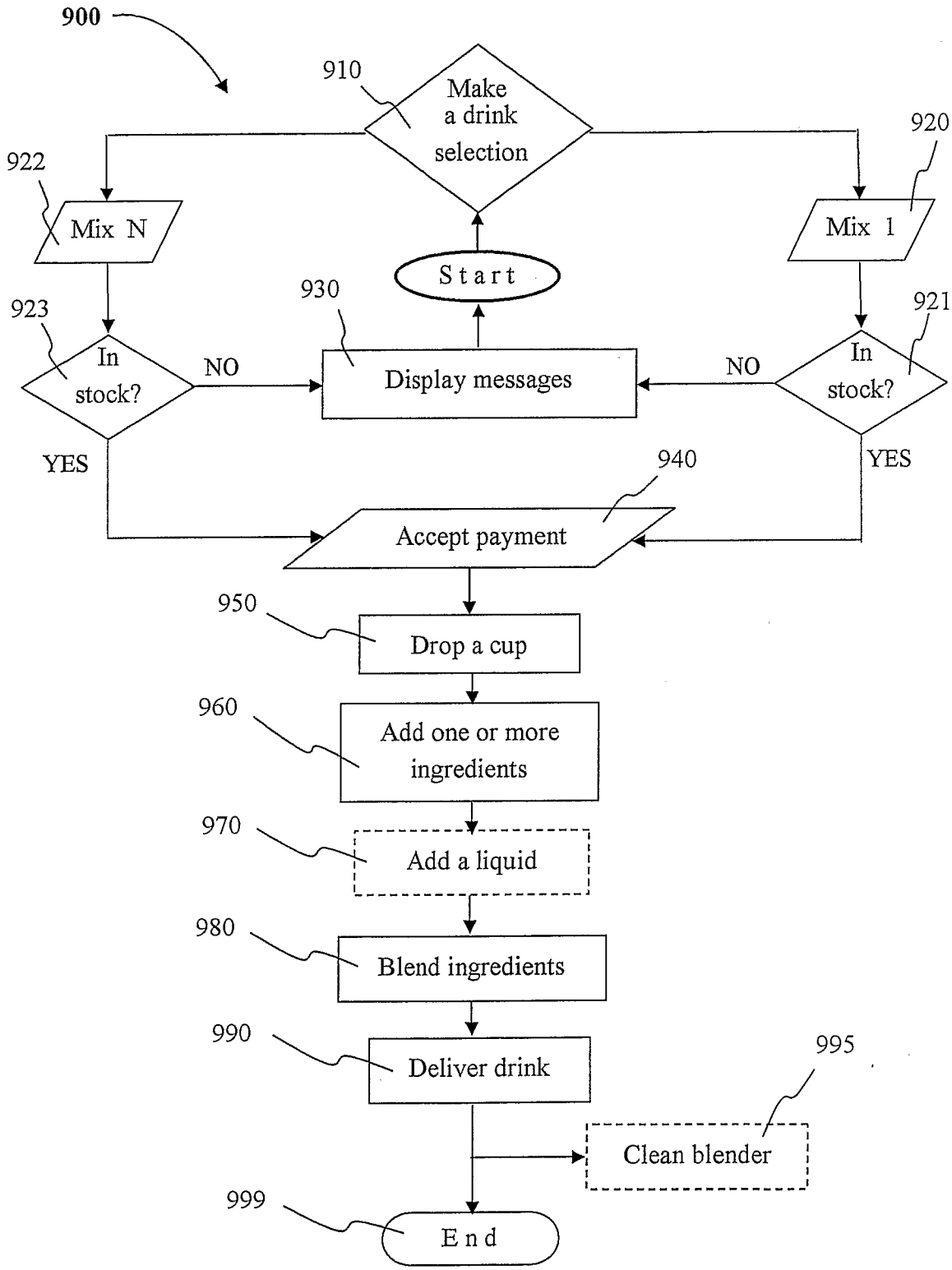

900
910
Make a drink selection
920
922
Mix N
Mix 1
Start
930
921
923
In stock?
NO
Display messages
NO
In stock?
YES
YES
940
Accept payment
950
Drop a cup
960
Add one or more ingredients
970
Add a liquid
980
Blend ingredients
990
Deliver drink
995
Clean blender
999
End

Fig. 9

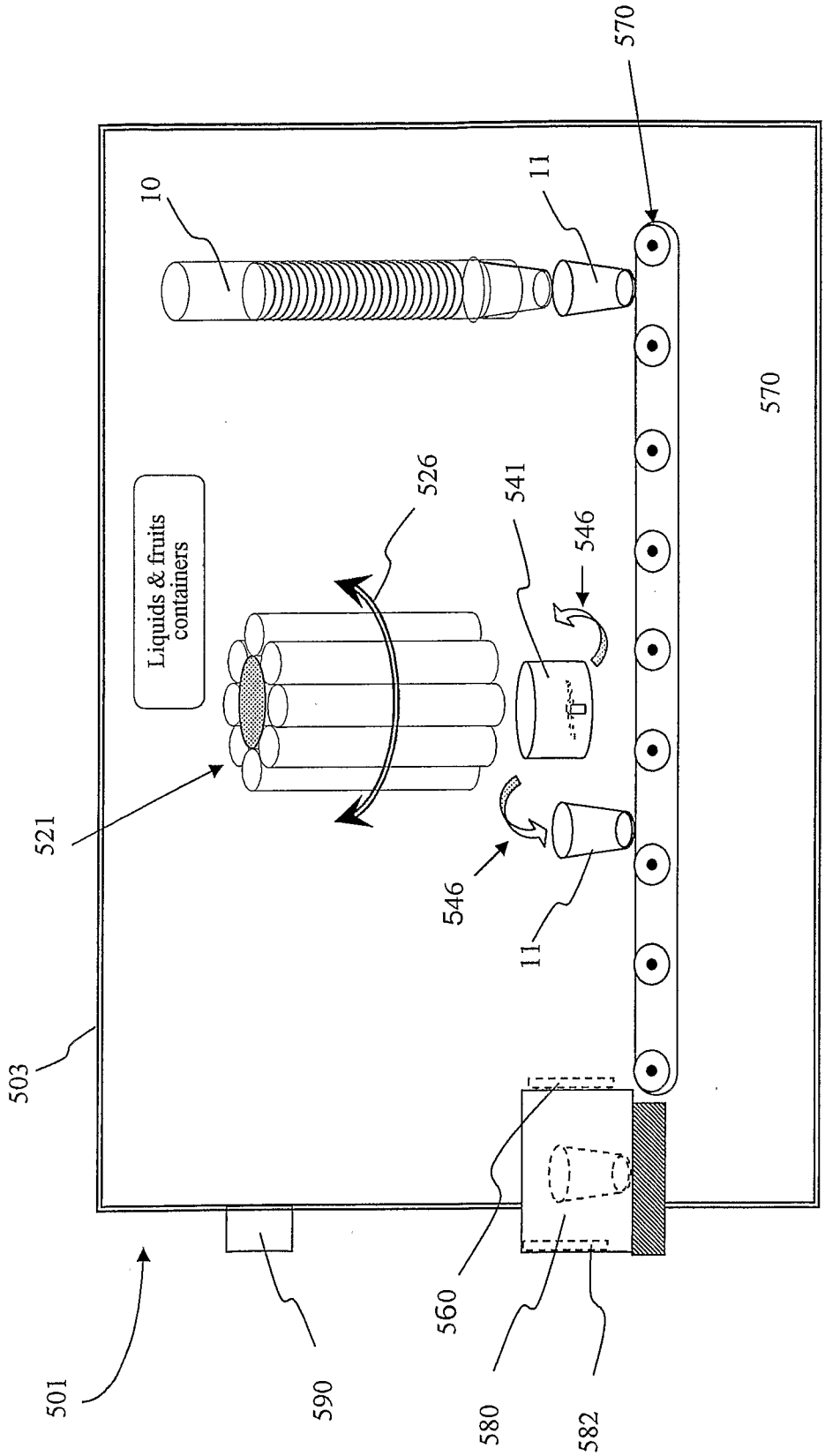

570
10
11
570
Liquids & fruits containers
526
541
546
521
546
11
503
501
590
560
580
582

Fig. 10

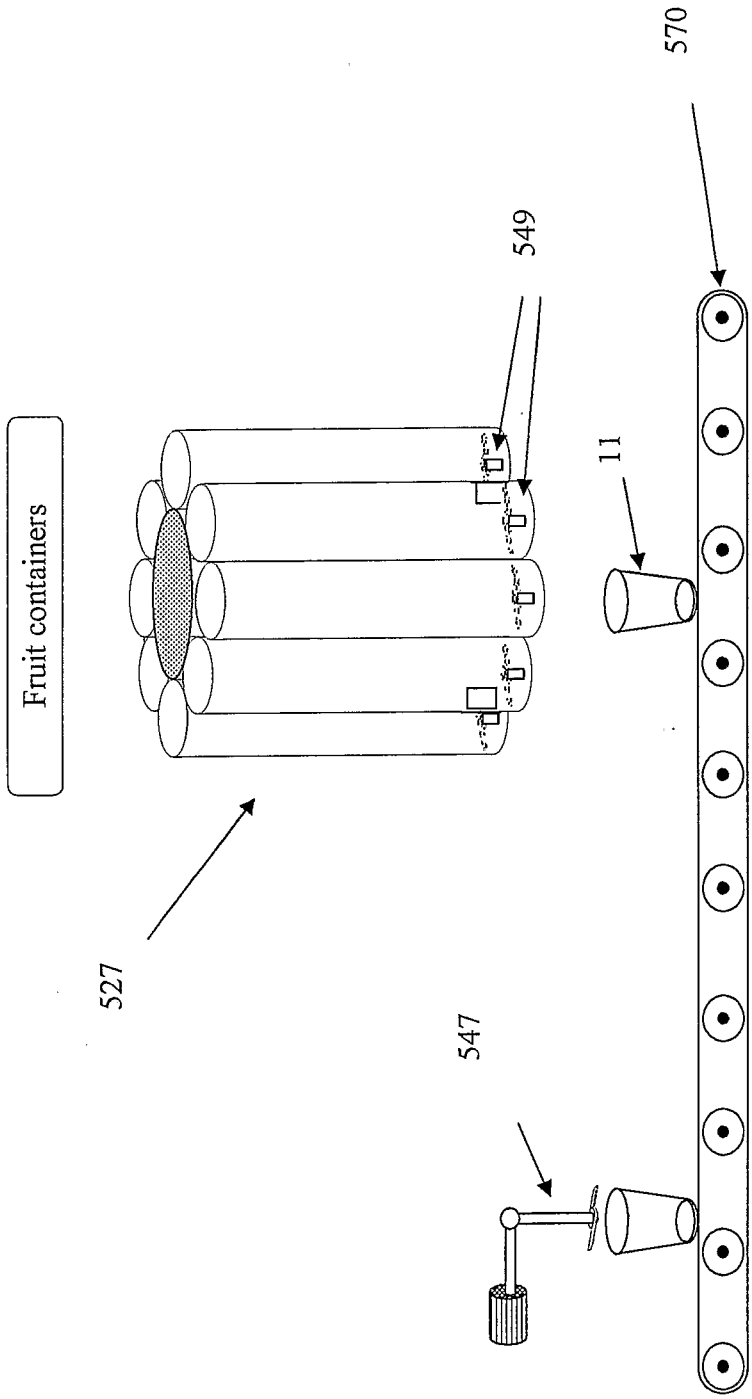


Fig. 11

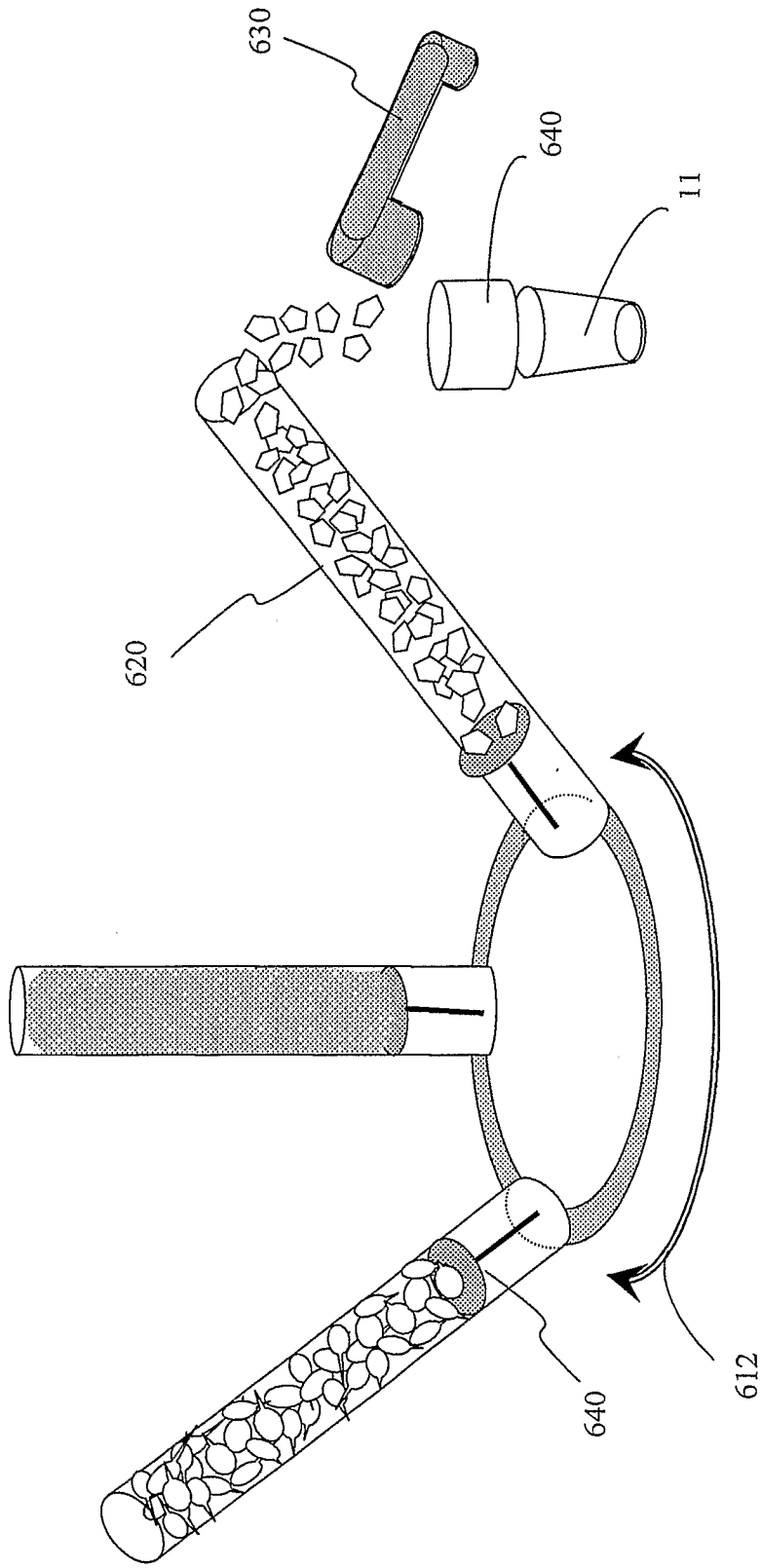


Fig. 12