

## **Food Flavouring Ingredient Dispensing Apparatus and System and Food Flavouring Dispensing Method**

### **Field of Invention**

[0001] The present invention relates to a food flavouring ingredient dispensing apparatus and system and a food flavouring dispensing method. For example, a food flavouring ingredient dispensing apparatus for dispensing a “small pour” of a food flavouring.

### **Background**

[0002] Flavour is an important determinant of food quality and the sensorial experience one obtains from eating is due to stimuli from the chemicals present in foods. Chemicals known as flavour compounds can contribute to taste, smell and trigeminal response. Food flavourings are, in general, used to emulate the flavours perceived from natural or traditionally prepared foods. The proper use of flavouring enables one to enhance or replenish flavour losses during processing, e.g. cooking. In the flavour industry, food flavouring ingredients can generally be classified into natural and artificial, of which some markets still adopt a dated categorisation which splits artificial into nature identical and synthetic. Natural flavouring ingredients may be obtained from natural sources, e.g. plant and animal. Nature identical flavouring ingredients refer to substances that are chemically identical to natural flavouring substances but are obtained through chemical processes. Synthetic flavouring ingredients refer to substances that are not naturally occurring.

[0003] To create a food flavouring, generally, natural or artificial flavour ingredients are mixed at certain proportions. Complex recipes may require more than twenty different ingredients. As such, there is a lot of transferring of ingredients, usually liquid or paste, from various containment units to a container for mixing. Conventional production methods would employ manual labour for the transportation and weighing of these ingredients. In addition to being labour intensive, it is inevitable that human errors occur due to factors such as miscommunication, fatigue or lack of concentration. In order to reduce dependency on human

manpower in such areas, machines are a viable solution. An automated dispensing method will enable a more efficient production and reduce error rates. Efficient production methods save time and manpower resources can then be channelled elsewhere. Reduced error rates ease the burden on quality control systems in place at the manufacturing facility.

[0004] It is therefore beneficial to provide a food flavouring ingredient dispensing apparatus 100 that is able to overcome the abovementioned disadvantages.

## **Summary**

[0005] According to various embodiments, a food flavouring ingredient dispensing apparatus for dispensing at least one ingredient is provided. Dispensing apparatus includes a dispensing unit adapted to dispense the at least one ingredient from an ingredient reservoir into a container for containing a food flavouring. The dispensing unit is adapted to be activated to dispense the at least one ingredient and deactivated to cease the dispensing. Dispensing apparatus has a weight sensor adapted to sense the weight of the at least one ingredient in the container, the weight sensor configured to communicate with the dispensing unit, such that the dispensing unit is deactivated when the at least one ingredient in the container reaches a pre-determined weight.

[0006] According to various embodiments, the dispensing unit may include a valve system adapted to control the dispensing of the at least one ingredient, a controller connected to the valve system and the weight sensor, such that the controller may be configured to receive a weight signal from the weight sensor and to transmit a control signal to control the valve system.

[0007] According to various embodiments, the at least one ingredient may be dispensed using pressurised gas.

[0008] According to various embodiments, the pressurised gas may be injected into the ingredient reservoir to pressurize the at least one ingredient from the ingredient reservoir into the dispensing unit.

[0009] According to various embodiments, the dispensing apparatus may further include a connector in fluid communication with the dispensing unit, the connector adapted to be connected to the ingredient reservoir and a pressurised gas source, such that the connector may be adapted to channel the at least one ingredient from the ingredient reservoir into the dispensing unit, and channel a pressurised gas into the ingredient reservoir.

[0010] According to various embodiments, the pressurised gas may include pressurised nitrogen.

[0011] According to various embodiments, the dispensing unit may include a dispensing portion comprising a plurality of dispensing heads, such that each of the plurality of dispensing heads may be adapted to dispense one of the at least one ingredient.

[0012] According to various embodiments, the ingredient reservoir may include a plurality of containment units, each comprising one of the at least one ingredients.

[0013] According to various embodiments, a food flavouring ingredient dispensing system for dispensing a plurality of ingredient is provided. The dispensing system includes a plurality of the food flavouring ingredient dispensing apparatus as mentioned above, and a transferring system adapted to transfer the container from one of the plurality of food flavouring dispensing apparatus to another.

[0014] According to various embodiments, the weight sensor may be adapted to be displaced between a non-weighing position and a weighing position to weigh the container and the at least one ingredient.

[0015] According to various embodiments, the weight sensor may be incorporated into the transferring system.

[0016] According to various embodiments, the transferring system may include a conveying portion adapted to convey the container, such that the weight sensor may be adapted to elevate the container from the conveying portion.

[0017] According to various embodiments, the conveying portion may include a pair of conveying track, such that the weight sensor may be disposed between the pair of conveying tracks.

[0018] According to various embodiments, the conveying portion may include rollers.

[0019] According to various embodiments, a food flavouring dispensing method for dispensing at least one ingredient from a food flavouring ingredient dispensing apparatus is provided. The method includes dispensing the at least one ingredient from an ingredient reservoir into a container for containing a food flavouring by a dispensing unit, the dispensing unit may be adapted to be activated to dispense the at least one ingredient and deactivated to cease the dispensing, sensing the weight of the at least one ingredient in the container, communicating with the dispensing unit, and deactivating the dispensing unit when the at least one ingredient in the container reaches a pre-determined weight.

[0020] According to various embodiments, the food flavouring dispensing method may further include receiving a weight signal from a weight sensor and transmitting a control signal to control a valve system.

[0021] According to various embodiments, the food flavouring dispensing method may further include injecting a pressurised gas into the ingredient reservoir to pressurize the at least one ingredient from the ingredient reservoir into the dispensing unit.

### **Brief Description of Drawings**

[0022] Fig. 1 shows a schematic diagram of an example of a food flavouring ingredient dispensing apparatus for dispensing at least one ingredient.

[0023] Fig. 2 shows a flowchart of a method for dispensing at least one ingredient from the food flavouring ingredient dispensing apparatus.

[0024] Fig. 3 shows a schematic diagram of an example of the food flavouring ingredient dispensing apparatus.

[0025] Fig. 4 shows a schematic diagram of an example of the dispensing unit.

[0026] Fig. 5 shows an example of the ingredient reservoir adapted to hold a plurality of ingredients.

[0027] Fig. 6 shows a sectional view of an example of the connector.

[0028] Fig. 7 shows a sectional view of an example of the connector.

[0029] Fig. 8 shows an elevation view of an example of a food flavouring ingredient dispensing system for dispensing a plurality of ingredient.

[0030] Fig. 9 shows a perspective view of the transferring system in Fig. 8.

[0031] Fig. 10 shows a perspective view of an example of a plate for supporting and stabilizing the container.

## **Detailed Description**

[0032] In the following examples, reference will be made to the figures, in which identical features are designated with like numerals.

[0033] Fig. 1 shows a schematic diagram of an example of a food flavouring ingredient dispensing apparatus 100 for dispensing at least one ingredient. Dispensing apparatus 100 includes a dispensing unit 110 adapted to dispense the at least one ingredient from an ingredient reservoir 120 into a container 130 for containing a food flavouring. Dispensing unit 110 is adapted to be activated to dispense the at least one ingredient and deactivated to cease the dispensing. Dispensing apparatus 100 includes a weight sensor 140 adapted to sense

the weight of the at least one ingredient in the container 130, the weight sensor 140 is configured to communicate with the dispensing unit 110. Dispensing unit 110 is deactivated when the at least one ingredient in the container 130 reaches a pre-determined weight.

[0034] Compared to conventional food flavouring machines, the food flavouring dispensing apparatus 100 in Fig. 1 has a relatively simple design. It is relatively simple to build and maintain the dispensing apparatus 100 as there are minimal and not many components and parts in the dispensing apparatus 100 compared to conventional machines. Further, in the event of a breakdown, it is not necessary to engage a highly trained technician as a normal technician would be able to repair it. Consequently, the parts for the repair would be relatively cheaper and more easily available. Therefore, it is easier and inexpensive to build and maintain the dispensing apparatus 100. In addition, the dispensing apparatus 100 in Fig. 1 may be configured to dispense the at least one ingredient for a small pour system. Small pour may be defined as having a quantity in the range of 1g to 2kg, preferably, 25g to 2kg. Conventional machines for small pour dispensing are highly sophisticated and expensive to buy or build. Dispensing apparatus 100 may be configured to provide an accurate and consistent dispensing of the at least one ingredient for small pour dispensing.

[0035] Fig. 2 shows a flowchart of a method 200 for dispensing at least one ingredient from the food flavouring ingredient dispensing apparatus 100. Method 200 includes, in block 210, dispensing the at least one ingredient from the ingredient reservoir 120 into the container 130 for containing a food flavouring by the dispensing unit 110. Dispensing unit 110 is adapted to be activated to dispense the at least one ingredient and deactivated to cease the dispensing. In block 220, the method 200 includes sensing the weight of the at least one ingredient in the container 130. Method 200 further includes communicating with the dispensing unit 110 in block 230 and deactivating the dispensing unit 110 when the at least one ingredient in the container 130 reaches a pre-determined weight in block 240.

[0036] Fig. 3 shows a schematic diagram of an example of the food flavouring ingredient dispensing apparatus 300. Dispensing apparatus 300 may include a valve system 350 adapted to control the dispensing of the at least one ingredient, a controller 360 connected to the valve system 350 and the weight sensor 340. Valve system 350 may be incorporated as part of the dispensing unit 310. Controller 360 may be configured to receive a weight signal from the

weight sensor 340 and transmit a control signal to control the valve system 350. Valve system 350 may be configured to be activated to dispense the at least one ingredient and deactivated to cease the dispensing. Weight sensor 340 may be a precision weighing scale. In this way, the dispensing apparatus 300 is able to accurately dispense the required amount of the at least one ingredient.

[0037] Referring to Fig. 3, the dispensing apparatus 300 may include a detector 370 adapted to detect an identifier on the container 330. Detector 370 may be connected to the controller 360. Controller 360 may be connected to a database for storing data, e.g. container data, food flavouring data, ingredient type and amount data. Controller 360 may be a programmable logic controller 360 (PLC) and may include a computing device, e.g. desktop computer, laptop. As shown in Fig. 3, the ingredient reservoir 320 may be connected to a pressurized gas inlet pipe 321 whereby the gas inlet pipe 321 may be connected to pressurized gas source, e.g. a gas tank (not shown in Fig. 3), such that the at least one ingredient may be dispensed using pressurised gas. Pressurized gas may be pumped into ingredient reservoir 320 to pressurize the at least one ingredient from the ingredient reservoir 320 into the dispensing unit 310. The transfer of the at least one ingredient may be a positive transfer of the at least one ingredient. Dispensing apparatus 300, via the controller 360, may control the valve system 350 to dispense the at least one ingredient. When the dispensing apparatus 300 detects, via the detector 370, that the correct container 330 is being positioned under the dispensing unit 310, the dispensing unit 310 may be activated to dispense the at least one ingredient. To activate the dispensing unit 310, the controller 360 may transmit a control signal to the valve system 350 to actuate the valve system 350 to release the at least one ingredient. As the at least one ingredient is being dispensed into the container 330, the weight sensor 340 may be configured to transmit the weight signal of the weight of the at least one ingredient that is being dispensed into the container 330 to the controller 360. Controller 360 may be programmed to dispense a pre-determined amount for the at least one ingredient. When the weight signal received by the controller 360 matches the pre-determined weight for the at least one ingredient, the dispensing unit 310 may be deactivated. To deactivate the dispensing unit 310, the controller 360 may then transmit the control signal to the valve system 350 to actuate the valve system 350 to cease the dispensing of the at least one ingredient into the container 330. Controller may also be connected to a pressurized gas

source (not shown in Fig. 3) for injecting the pressurized gas into the ingredient reservoir 320 so as to pressurize the ingredient reservoir to drive the at least one ingredient to the dispensing unit 310.

[0038] Fig. 4 shows a schematic diagram of an example of the dispensing unit 310. Dispensing unit 310 may be configured to receive the at least one ingredient from the ingredient reservoir 320 and dispense the at least one ingredient into the container 330 (not shown in Fig. 4). While reference to the following features is to the dispensing unit 310 of Fig. 3, the features described are also intended for the dispensing unit 110 in Fig. 1. Dispensing unit 310 may include a dispensing portion 310D having a plurality of dispensing heads 312, wherein each of the plurality of dispensing heads 312 may be adapted to dispense one of the at least one ingredient. Plurality of dispensing heads 312 may include a plurality of nozzles 312N. Dispensing unit 310 may be configured to dispense a plurality of ingredients as each nozzle 312N may be adapted to dispense one ingredient. Each nozzle 312N may be in fluid communication with the ingredient reservoir 320. Ingredient reservoir 320 may include a plurality of ingredients. Dispensing apparatus 300 may include a guide 314 adapted to guide the nozzle 312N. Ingredient reservoir 320 may include a plurality of containment units (not shown in Fig. 4) such that each containment unit may contain one ingredient. Each nozzle 312N may be connected to the containment unit via a conduit, e.g. a tube or pipe. An example of the ingredient reservoir 320 is shown in Fig. 5. Referring to Fig. 4, the dispensing portion 310D may include the valve system 350 therein such that the valve system 350 may be disposed within the dispensing unit 310. As shown in Fig. 4, the valve system 350 may include a plurality of valves 352. Each valve 352 may be connected to each nozzle 312N. Dispensing head 312 may include a valve 352. Each valve 352 may be connected to the controller 360 (not shown in Fig. 4) and controlled by the controller 360 to dispense the ingredient or otherwise. Valve 352 may include a clamping valve such that, when actuated, the valve 352 may be adapted to clamp the nozzle 312N to restrict a fluid flow through the nozzle 312N thereby deactivating the dispensing unit 310 to cease the dispensing of an ingredient. Conversely, the valve 352 may be actuated to unclamp the nozzle 312N to allow fluid flow through the nozzle 312N thereby activating the dispensing unit 310 to dispense the ingredient. Each valve 352 may be a solenoid valve. Alternatively, the valve 352 may be a stop valve connected to the nozzle 312N to stop or allow fluid flow through the valve 352 to dispense or cease the dispensing of the ingredient. Each nozzle 312N may be adapted to

dispense a plurality of ingredients as each nozzle 312N may be fluidly connected to a plurality of containment units. While it is shown that the dispensing unit 310 dispenses the at least one ingredient via pressurized gas, it is possible that the dispensing unit 310 may include a pump adapted to pump the at least one ingredient from the ingredient reservoir 320 and dispense it into the container 330.

[0039] Fig. 5 shows an example of the ingredient reservoir 320 adapted to hold a plurality of ingredients. Ingredient reservoir 320 may include a plurality of containment units 322, each adapted to hold one of the at least one ingredients. Containment unit 322 may be a cannister adapted to contain an ingredient. As shown in Fig. 5, the ingredient reservoir 320 may include a rack 324 adapted to hold the plurality of containment units 322. Containment units 322 may vary in size. As shown in Fig. 5, the cannisters may be variedly sized such that there are large sized cannisters, medium sized cannisters and small sized cannisters. Each cannister may have an opening adapted to be connected to a connector 180 (not shown in Fig. 5) that connects the cannister to the dispensing unit 310 (not shown in Fig. 5). While the containment units 322 may be variedly sized, each containment unit 322 may have the same interface for connecting to the dispensing unit 310 so that all sizes of containment units 322 may be connected to the connector 180. For example, each cannister, small, medium or large may have the same opening so that they may be connected to the connector 180.

[0040] Fig. 6 shows a sectional view of an example of the connector 180. Connector 180 may include a cap 182 adapted to be connected to the containment unit 322 (not shown in Fig. 6). Connector 180 may be adapted to channel the at least one ingredient from the ingredient reservoir 120 into the dispensing unit 110, and channel a pressurised gas into the ingredient reservoir 120. Cap 182 may be adapted to receive a pair of tubes T1,T2. Tube T1 may extend through the cap 182. Cap 182 may include a connecting portion 182C adapted to connect to the opening of the canister. Connecting portion 182C may include a recess 182R adapted to receive and engage the opening of the canister. In an example where the canister has a neck 322N (shown in Fig. 5), the recess 182R may be adapted to receive and engage the neck 322N therein. Recess 182R may be threaded to engage the neck 322N if the neck 322N is threaded. Cap 182 may include a snap on configuration where the cap 182 may be snapped fitted onto the neck 322N to secure the cap 182 onto the neck 322N. Connection between the connector 180 and the neck 322N may be air-tight. Cap 182 may include a pair of through

holes 182T adapted to receive the pair of tubes T1,T2 therethrough. Connector 180 may include a pair of tube connectors 184A,184B attached to the cap 182 and extending through the pair of through holes 182T. One of the pair of through holes 182T, e.g. the left through hole, may be adapted to receive one of the pair of tube connectors 184A, e.g. a bulkhead, fitting therein. The whole length of the inner wall of the left through hole may be threaded to engage the tube connector 184A. One of the pair of through holes 182T, e.g. the right through hole, may be adapted to receive the other of the pair of tube connectors 184B, e.g. a tube fitting, therein. Right through hole may be threaded partially if the tube connector 184B is engaged only to a portion of the right through hole. Tube connectors 184A,184B may be adapted to connect and secure the pair of tubes T1,T2 through the cap 182. Tube T1 may be connected to the dispensing unit 110 (not shown in Fig. 6). Tube T2 may be connected to the pressurized gas source (not shown in Fig. 6), e.g. gas tank. Tube T1 may extend into the containment unit 322. Tube T1 may extend into the ingredient. Tube T2 may be connected to the cap 182 without extending through the cap 182. Tube connectors 184A,184B may provide an air-tight connection around the tubes T1,T2 so that the pressurized gas may be maintained within the containment unit 322 and at the same time, the ambient air is prevented from entering the containment unit 322 as ambient air may contaminate the ingredient. Connector 180 provides a quick connection and release to the containment unit 322, i.e. canister, and allows an air-tight containment unit 322 to be achieved. Further, the connector 180 may provide a single connection to any sized containment unit 322. There may be more than one tube T1 or a plurality of tubes T1 that is connected between the dispensing unit 110 and the connector 180, e.g. two or more tubes. As such, the connector 180 may include more than one through hole 182T or a corresponding number of through holes 182T and tube connectors 184A to receive the tubes T1. Plurality of tubes T1 may have different internal diameters such that one or more tubes may be larger than others. By having more than one tube and varying the diameter of the tubes, the dispensing unit 110 may be adapted to take in and dispense ingredient of varying volumes and viscosities.

[0041] Referring to Fig. 3, each container 330 may include an identifier for identifying the container 330 and the food flavouring therein. Identifier may include a photocell, a barcode, a QR code, RFID, etc. When the container 330 is positioned to receive the at least one ingredient, the dispensing apparatus 300 may activate the detector 370 to detect the identifier. Upon detecting the identifier, the detector 370 may transmit data relevant to the container 330

to the controller 360. Controller 360 may include a program for dispensing the ingredients for the food flavouring as identified by the identifier and configured to activate the dispensing unit 310 to dispense the required amount of ingredient for the food flavouring.

[0042] After verifying the container 330 and the food flavouring for the container 330, the dispensing apparatus 300 may be configured to dispense the required at least one ingredient into the container 330. Controller 360 may determine, based on the program, the at least one ingredient to be dispensed from the dispensing apparatus 300. Controller 360 may activate the dispensing unit 310 by actuating the valve 352 that is related to the ingredient to be dispensed to dispense the ingredient. If there is a plurality of ingredients to be dispensed at the dispensing apparatus 300, the plurality of valves 352 that are related to the plurality of ingredients may be actuated. Plurality of valves 352 may be actuated sequentially. In other words, each ingredient may be dispensed one at a time. Weight sensor 340 may sense the weight of the ingredient that is being dispensed into the container 330. Controller 360 may be configured to receive a weight signal from the weight sensor 340 and transmit a control signal to control the valve system 350 when necessary. Controller may activate the pressurized gas source to inject the pressurised gas into the ingredient reservoir 320 to pressurize the at least one ingredient from the ingredient reservoir 320 into the dispensing unit 310. When the desired weight of the ingredient or plurality of ingredients is received, the controller 360 may actuate the valve 352 to cease the dispensing of the ingredient.

[0043] Dispensing apparatus 300 may be a closed system such that the at least one ingredient from the ingredient reservoir 320 to the dispensing unit 310 is not exposed to the atmosphere. A closed system is obtained when the connection from the ingredient reservoir 320 to the dispensing unit 310, including the dispensing head is air-tight. Connector 180 may be air-tightly sealed to the containment unit 322 and the tubes T1,T2 are air-tightly sealed to the connector 180. The dispensing operation is gas pressured and the at least one ingredient is channelled from the ingredient reservoir 320 to the dispensing head 312 without being in contact with the atmosphere or ambient air. In this way, there may be minimal or no exposure of the at least one ingredient to contaminants and the atmosphere, that may cause the at least one ingredient to deteriorate, before dispensing. By having a closed system, the at least one

ingredient may be segregated from the atmosphere thereby protecting the ingredient in the ingredient reservoir 320 from deterioration. Pressurized gas may include an inert gas. Pressurized gas may include a mixture of gases, etc. Preferably, the pressurized gas may be nitrogen gas.

[0044] Fig. 7 shows a sectional view of an example of the connector 780. Tube connector 784A may include a clamping portion 7842 adapted to clamp the tube T1. Tube connector 784A may include a cylindrical housing 784A2. Clamping portion 7842 may include a shoulder 784A4 within the housing 784A2, a cylindrical wedge 784A6 disposed within the housing 784A2 against the shoulder 784A4 and a retainer 784A8 adapted to be movably attached to the housing 784A2 and retain the wedge 784A6 within the housing 784A2. Wedge 784A6 may be adapted to surround the tube T1. Retainer 784A8 may be adapted to be tightened onto the housing 784A2 and push the wedge 784A6 against the shoulder 784A4 thereby forcing the wedge 784A6 to contract towards the centre of the housing 784A2. When a tube T1 is within the tube connector 784A, the wedge 784A6 may contract and clamp onto the tube T1. Wedge 784A6 may provide an air-tight seal around the tube T1.

[0045] Fig. 8 shows an elevation view of an example of a food flavouring ingredient dispensing system 1000 for dispensing at plurality of ingredient. Dispensing system 1000 includes a plurality of the food flavouring ingredient dispensing apparatus 100,300 as shown in any one of the abovementioned examples, a transferring system 1100 adapted to transfer the container 130 from one of the plurality of food flavouring dispensing apparatus 100 to another. While reference to the following features is to the dispensing apparatus 100 of Fig. 1, the features described are suitable for the dispensing apparatus 300 in Fig. 3 as well. As shown in Fig. 8, the dispensing system 1000 may include four dispensing apparatus 100A,100B,100C,100D. Although the example of the dispensing system 1000 in Fig. 8 includes four dispensing apparatus 100, the dispensing system 1000 may be scalable to include more than four dispensing apparatus 100 or reduced to fewer than four dispensing apparatus 100.

[0046] Referring to Fig. 8, the dispensing system 1000 may be configured to transfer the container 130 to the first dispensing apparatus 100A to dispense at least one ingredient into

the container 130. Dispensing system 1000 may detect the identifier on the container 130 before dispensing the at least one ingredient to identify the food flavouring to be mixed in the container 130 and dispense the required at least one ingredient at the first dispensing apparatus 100A into the container 130. Each of the dispensing apparatus 100 may be configured to dispense specific types of ingredients such that an ingredient that is being dispensed from one dispensing apparatus 100 may not be dispensed from another. For example, a container 130 for a food flavouring that requires a number of ingredients that are dispensed from three of the four dispensing apparatus 100 in Fig. 8 will have to be transferred to three of the four dispensing apparatus 100A, 100B, 100C, 100D to receive all the ingredients for the food flavouring. Once the container 130 has been identified, the controller 360 may determine, based on the program, the at least one ingredient to be dispensed from the first dispensing apparatus 100A. Controller 360 may activate the dispensing unit 110 by actuating the valve 352 that is related to the ingredient to be dispensed to dispense the ingredient. If there is a plurality of ingredients to be dispensed at the first dispensing apparatus 100A, the plurality of valves 352 that are related to the plurality of ingredients may be actuated. Plurality of valves 352 may be actuated sequentially. In other words, each ingredient may be dispensed one at a time. Weight sensor 140 at the dispensing apparatus 100A may sense the weight of the ingredient that is being dispensed into the container 130. When the desired weight of the ingredient is received, the controller 360 may actuate the valve 352 to cease the dispensing of the ingredient. When all the ingredients to be dispensed from the first dispensing apparatus 100 have been dispensed, the dispensing system 1000 may activate the transferring system 1100 to transfer the container 130 from the first dispensing apparatus 100A to the second or adjacent dispensing apparatus 100B. Dispensing system 1000 may detect the identifier of the container 130 again to verify that identity of the container 130. Depending on the ingredients required, the dispensing system 1000 may not transfer the container 130 to the adjacent dispensing apparatus 100B. Dispensing system 1000 may transfer the container 130 to any other dispensing apparatus 100 along the line of dispensing apparatus 100, e.g. third dispensing apparatus 100C.

[0047] Weight sensor 140 may be adapted to be displaced between a non-weighing position and a weighing position to weigh the container 130 and the at least one ingredient. Weight sensor 140 may be a weighing scale disposed beneath the container 130. Weight sensor 140 may be spaced from the container 130 in the non-weighing position. Weight sensor 140 may

be adapted to be raised to support and/or raise the container 130 in the weighing position when the container 130 is being positioned at the dispensing apparatus 100 so as to weigh the container 130 before dispensing the ingredient. After the dispensing is completed, the weight sensor 140 may be lowered back to the non-weighing position before the container 130 is being transferred. Weight sensor 140 may be incorporated into the transferring system 1100 such that the weight sensor 140 may be disposed at the transferring system 1100 and not at the dispensing apparatus 100.

[0048] Fig. 9 shows a perspective view of the transferring system 1100 in Fig. 8. Transferring system 1100 may include a conveying portion 1120 adapted to convey the container 130. Weight sensor 140 (not shown in Fig. 9) may be adapted to elevate the container 130 from the conveying portion 1120. Conveying portion may include a conveying track. Conveying track may include at least one of rollers, conveyor belt, etc. As shown in Fig. 9, the conveying portion 1120 may include a pair of conveying tracks such that the weight sensor 140 may be disposed between the pair of conveying tracks. Conveying tracks may transfer the container 130 to under the dispensing apparatus 100 (not shown in Fig. 9). In the position, the weight sensor 140 between the conveying tracks may be raised to contact and lift the container 130 from the conveying tracks before dispensing. After dispensing, the weight sensor 140 may be lowered to place the container 130 back onto the conveying tracks so that the conveying tracks can transfer the container 130 away to another location, e.g. to another dispensing apparatus 100.

[0049] Dispensing system 1000 may include a plate 1110 adapted to support and stabilise the container 130 during transfer. Fig. 10 shows a perspective view of an example of the plate 1110. Plate 1110 may include a depression 1112 for receiving the container 130 therein so that the container 130 may not slip out of the plate 1110 during transfer. Plate 1110 may be configured to be larger than the base of the container 130 so as to provide stability to the container 130 during transfer. Plate 1110 may be placed onto the conveying portion 1120 and below the container 130 as shown in Fig. 9.

[0050] As shown, the food flavouring dispensing apparatus 100 and the food flavouring dispensing system 1000 has a relatively simple design which is relatively simple to build and maintain. In addition, they are scalable to accommodate any number and types of ingredients.

[0051] A skilled person would appreciate that the features described in one example may not be restricted to that example and may be combined with any one of the other examples.

[0052] The present invention relates to a food flavouring ingredient dispensing apparatus, a food flavouring ingredient dispensing system for dispensing at plurality of ingredient, and a food flavouring dispensing method for dispensing at least one ingredient from a food flavouring ingredient dispensing apparatus generally as herein described, with reference to and/or illustrated in the accompanying drawings.

## Claim

1. A food flavouring ingredient dispensing apparatus for dispensing at least one ingredient, the dispensing apparatus comprising:

a dispensing unit adapted to dispense the at least one ingredient from an ingredient reservoir into a container for containing a food flavouring, the dispensing unit is adapted to be activated to dispense the at least one ingredient and deactivated to cease the dispensing;

a weight sensor adapted to sense the weight of the at least one ingredient in the container, the weight sensor configured to communicate with the dispensing unit;

wherein the dispensing unit is deactivated when the at least one ingredient in the container reaches a pre-determined weight.

2. The dispensing apparatus of claim 1, wherein the dispensing unit comprises a valve system adapted to control the dispensing of the at least one ingredient, a controller connected to the valve system and the weight sensor, wherein the controller is configured to receive a weight signal from the weight sensor and to transmit a control signal to control the valve system.

3. The dispensing apparatus of claim 1 or 2, wherein the at least one ingredient is dispensed using pressurised gas.

4. The dispensing apparatus of claim 3, wherein the pressurised gas is injected into the ingredient reservoir to pressurize the at least one ingredient from the ingredient reservoir into the dispensing unit.

5. The dispensing apparatus of claim 3 or 4, further comprising a connector in fluid communication with the dispensing unit, the connector adapted to be connected to the ingredient reservoir and a pressurised gas source, wherein the connector is adapted to channel the at least one ingredient from the ingredient reservoir into the dispensing unit, and channel a pressurised gas into the ingredient reservoir.

6. The dispensing apparatus of any one of claims 3 to 5, wherein the pressurised gas comprises pressurised nitrogen.
7. The dispensing apparatus of any one of claims 1 to 6, wherein the dispensing unit comprises a dispensing portion comprising a plurality of dispensing heads, wherein each of the plurality of dispensing heads is adapted to dispense one of the at least one ingredient.
8. The dispensing apparatus of claim 7, wherein the ingredient reservoir comprises a plurality of containment units, each comprising one of the at least one ingredients.
9. A food flavouring ingredient dispensing system for dispensing at plurality of ingredient, the dispensing system comprising:
  - a plurality of the food flavouring ingredient dispensing apparatus at claimed in any one of claims 1 to 8; and
  - a transferring system adapted to transfer the container from one of the plurality of food flavouring dispensing apparatus to another.
10. The dispensing system of claim 10, wherein the weight sensor is adapted to be displaced between a non-weighing position and a weighing position to weigh the container and the at least one ingredient.
11. The dispensing system of claim 9 or 10, wherein the weight sensor is incorporated into the transferring system.
12. The dispensing system of any one of claims 9 to 11, wherein the transferring system comprises a conveying portion adapted to convey the container, wherein the weight sensor is adapted to elevate the container from the conveying portion.
13. The dispensing system of claim 12, wherein the conveying portion comprises a pair of conveying tracks, wherein the weight sensor is disposed between the pair of conveying tracks.
14. The dispensing system of claim 13, wherein the conveying portion comprises rollers.

15. A food flavouring dispensing method for dispensing at least one ingredient from a food flavouring ingredient dispensing apparatus, the method comprising:

dispensing the at least one ingredient from an ingredient reservoir into a container for containing a food flavouring by a dispensing unit, the dispensing unit is adapted to be activated to dispense the at least one ingredient and deactivated to cease the dispensing;

sensing the weight of the at least one ingredient in the container;

communicating with the dispensing unit; and

deactivating the dispensing unit when the at least one ingredient in the container reaches a pre-determined weight.

16. The food flavouring dispensing method, further comprising receiving a weight signal from a weight sensor and transmitting a control signal to control a valve system.

17. The food flavouring dispensing method, further comprising injecting a pressurised gas into the ingredient reservoir to pressurize the at least one ingredient from the ingredient reservoir into the dispensing unit.