United States Patent

Van Cleven et al.

[15] **3,690,247**

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[54] **POTATO CHIP DISPENSING APPARATUS**

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Oct. 29, 1970 Belgium.....50563

[52] **U.S. Cl.** .....**99/355,** 99/356, 99/357, 99/407, 221/150 HC

[51] **Int. Cl.**.....**A47j 37/12**

[58] **Field of Search**.....99/457, 355, 356, 357, 407; 221/150 HC, 150 A, 150 B

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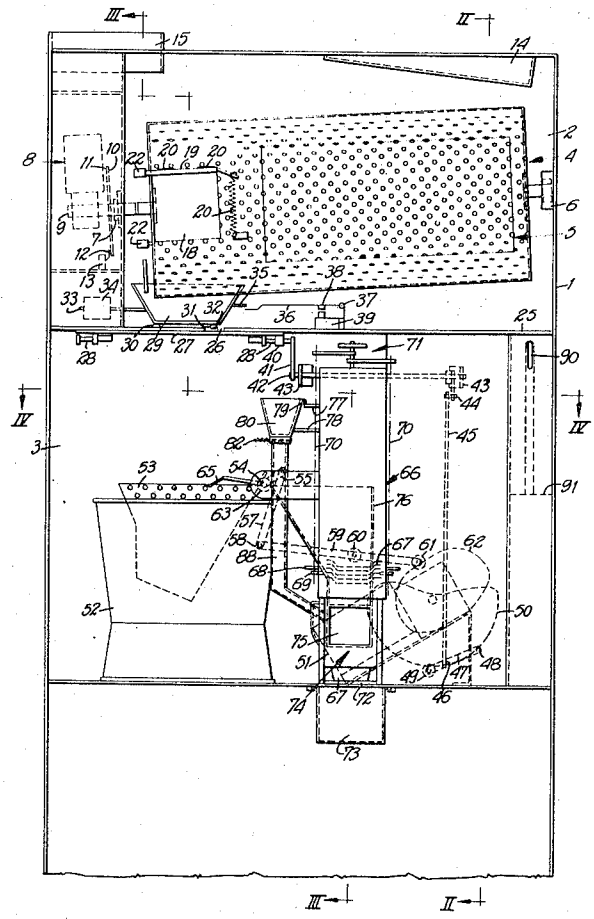
[57] **ABSTRACT**

The invention relates to a potato chip dispensing apparatus, i.e., a fully automatic device for the preparation and packing of (French-fried) potato chips, in which, after insertion of a certain number of coins into an appropriate slot, without any human intervention a portion or helping of potato chips is fried, packed, salted according to the buyer's wish and brought within reach of the person who has inserted the coins.

5 Claims, 11 Drawing Figures



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SHEET 1 OF 5

Fig. 1

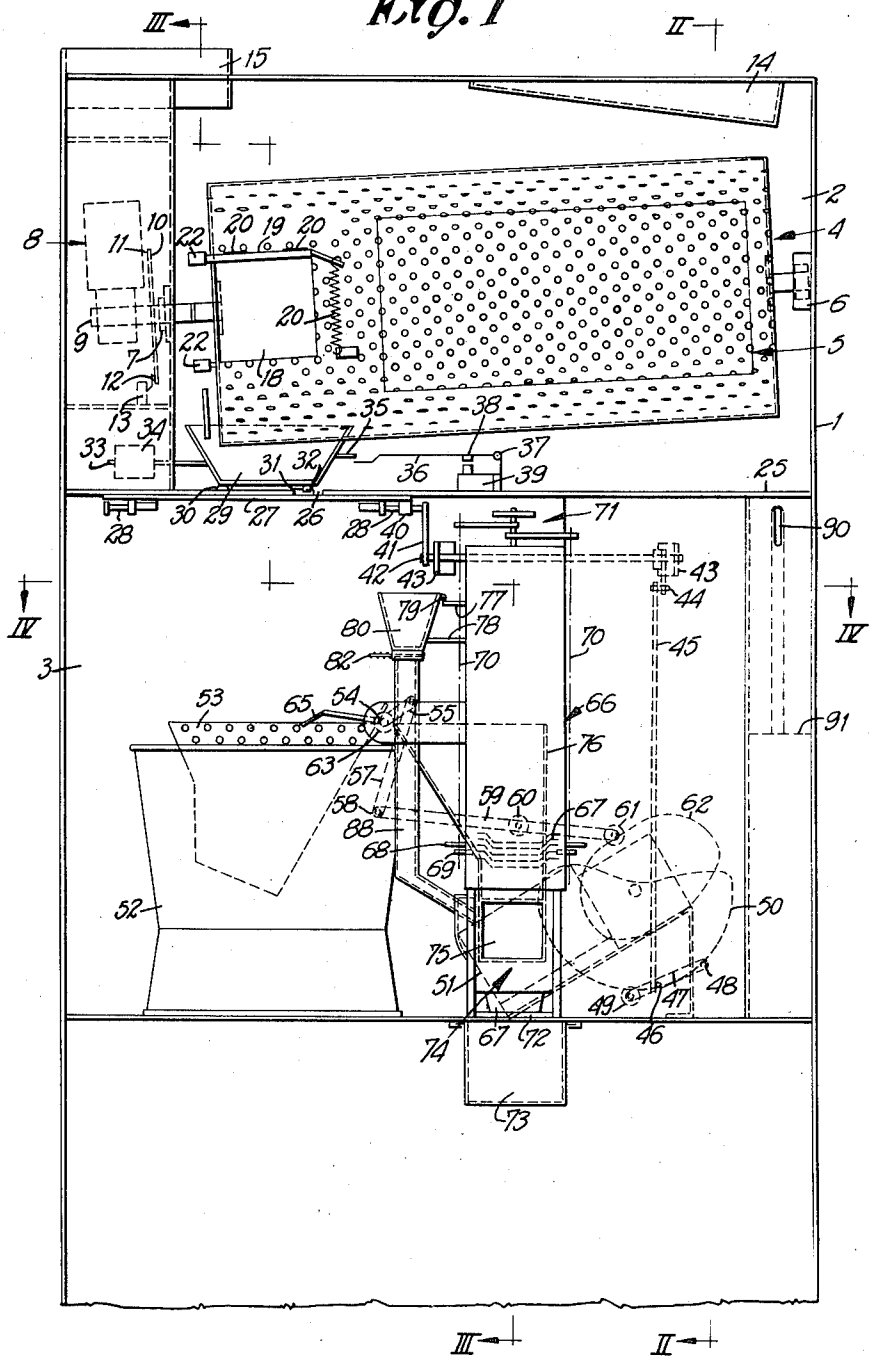

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Fig. 2

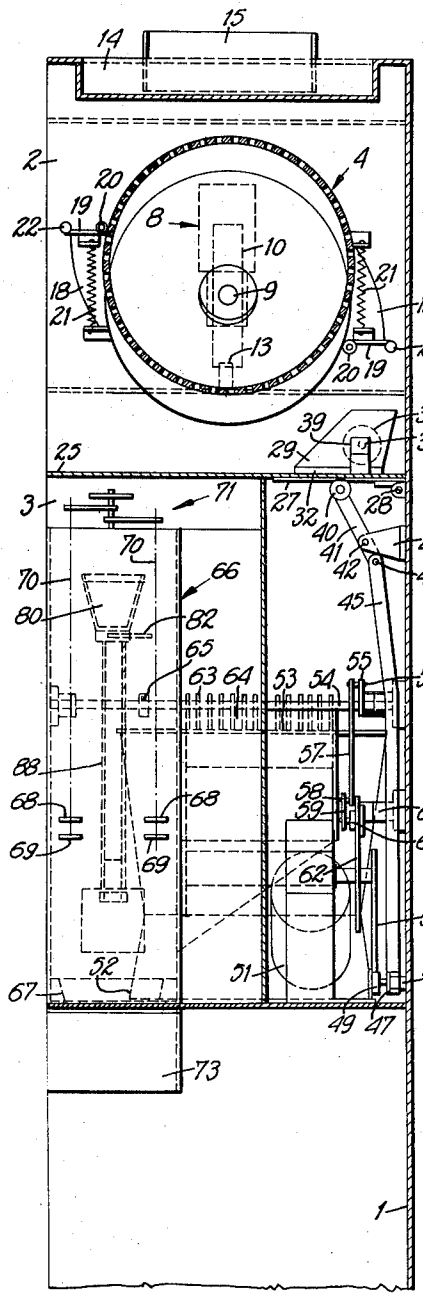

Fig. 3

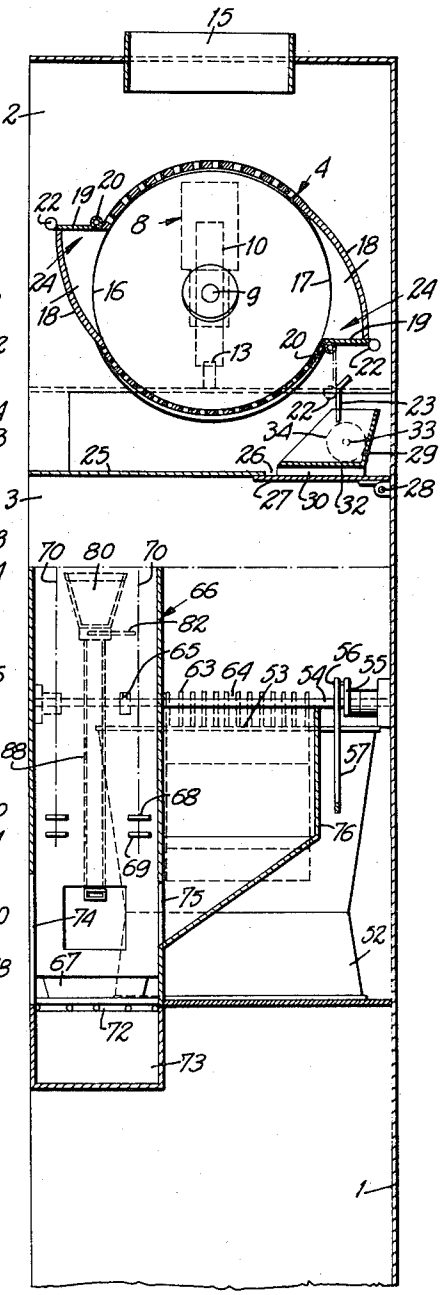

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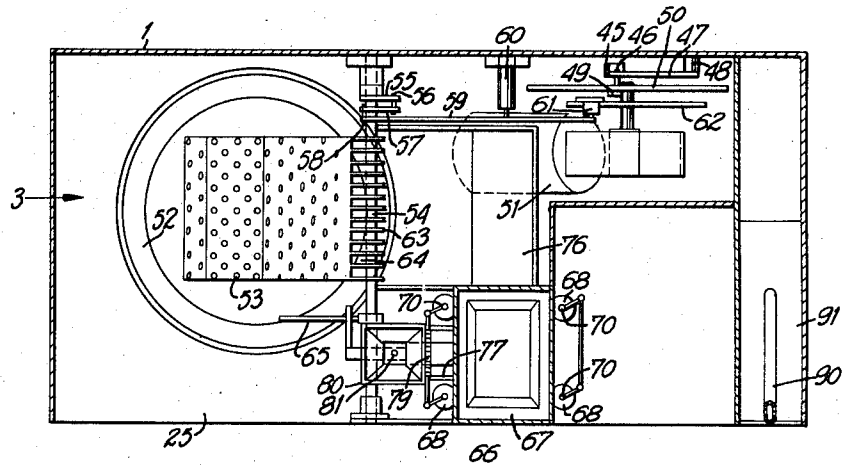
Fig. 4



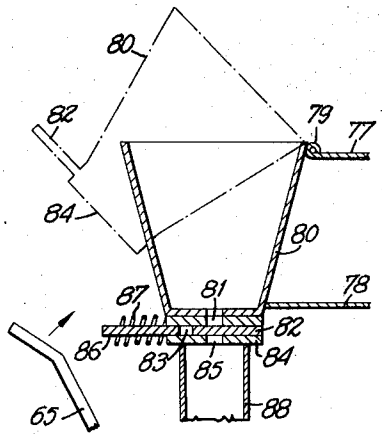


Fig. 9

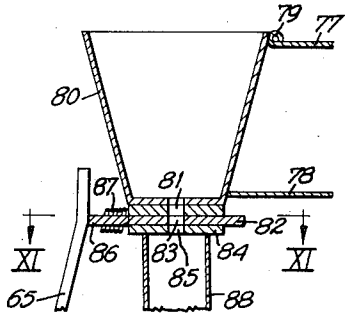


Fig. 10

Fig. 11

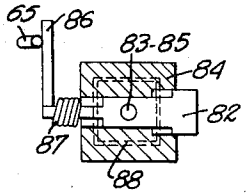


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Fig. 5

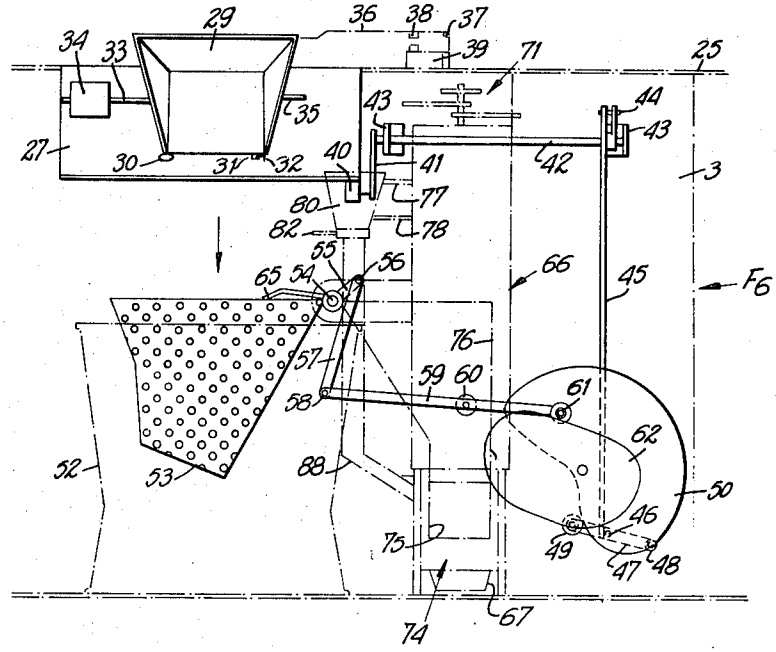

Fig. 6

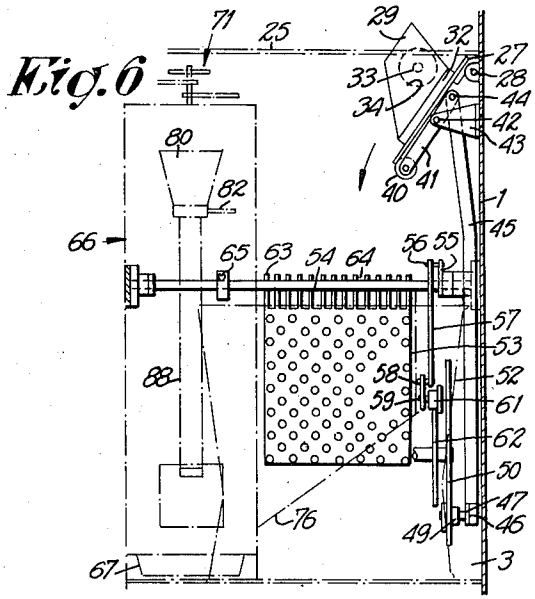

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Fig. 7

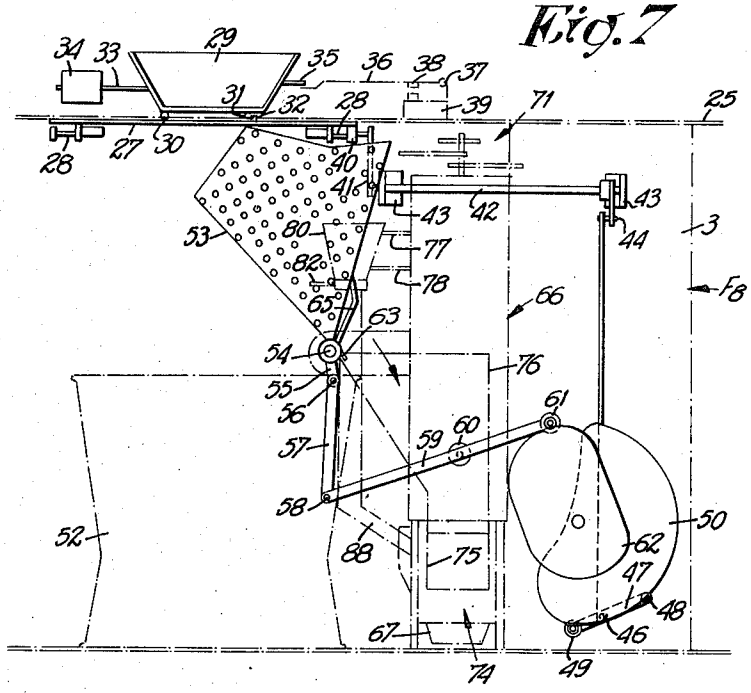
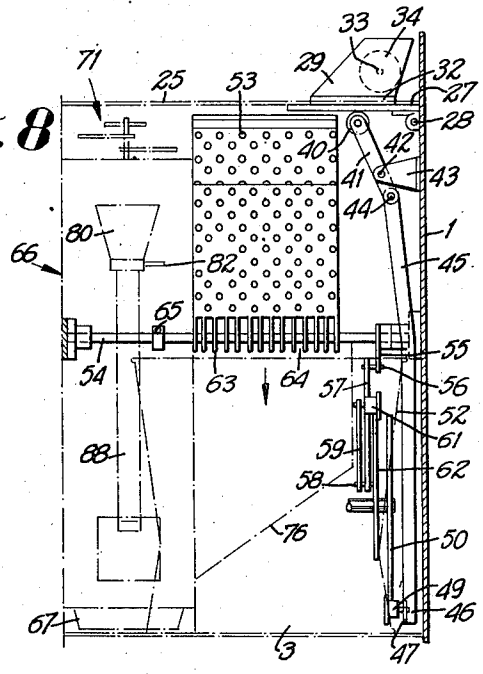


Fig. 8



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POTATO CHIP DISPENSING APPARATUS

The present invention relates to an automatic potato chip dispensing apparatus. Various solutions for such apparatuses have already been proposed, but up to now all known devices of this kind have drawbacks of such nature as to preclude their general use, especially in cases where helpings of potato chips are purchased at irregular times.

There are mainly two different kinds of such apparatuses.

In apparatuses of the first kind use is made of an endless chain with a certain number of baskets hinged at spaced positions thereon, said baskets being conveyed first underneath a storage container filled with cut and sliced potatoes, and then through a vessel filled with hot oil or fat so as to cause the potato chips to be fried, whereupon said baskets are tipped over one after the other so as to pour their contents into appropriate packing material.

An apparatus of this kind is capable of relatively satisfactory operation in cases where helpings of potato chips are wanted continuously in regular succession; it is of no use in cases where the demand comes from time to time, at moments irregularly spaced in time.

In apparatus of a second type, after insertion of a coin a helping of potato chips is automatically drawn or scooped from a storage container, said helping being then dropped into a basket, whereupon the latter is immersed in a cauldron filled with hot oil or fat. After the chips have been fried, the basket is removed from the cauldron and tipped over above the mouth of a funnel through which the fried chips are conveyed into a packing means such as a dish.

The present invention relates more specifically to a potato chips dispensing apparatus of said second type; with the object of providing a highly efficient apparatus which can be used in all circumstances without difficulties, the apparatus according to the invention is distinguished by the following characteristics:

According to a first characteristic of the apparatus according to the invention, the storage drum containing a provision of potato chips is made of perforated sheet material in order to ensure adequate ventilation and/or cooling of said provision of potato chips, said storage drum preferably being in constant communication with the open air and/or with a cooling installation.

In fact it has been found that such ventilation or cooling, depending on the ambient temperature prevailing in the environment of the apparatus, is necessary in order to ensure the wanted crispness of the finished potato chips.

According to another feature of the present invention, on said storage drum are provided at least one, but preferably two or more scooping receptacles, each having a capacity which preferably is small with respect to the quantity of chips in each helping, so as to ensure very accurate apportioning of chips.

Yet another feature consists in that, in order to minimize the transfer of heat from the compartment containing said frying cauldron to the compartment containing said storage drum for the provision of potato chips, said compartments are separated from each other by means of an insulating partition, in order to ensure effectiveness of said ventilation and/or cooling as well as minimizing of the heat transfer losses from the frying chamber.

Another feature of the potato chip dispensing apparatus according to the invention consists in that the quantity of chips in each helping is determined by weight rather than volume, as hitherto usual, whereby in conjunction with the fact that each helping is collected by small quantities, an arrangement is produced which ensures highly accurate apportioning of the chips. It is in fact very desirable that the portions successively subjected to frying are equal, in order to ensure that each time, for a predetermined frying time, the same quantity of potato chips is immersed in the oil or fat, so as to obtain a well-fried end product of constant quality.

Still another feature of the invention consists in the use of a frying basket specially designed to minimize losses of fat or oil during the tipping-over operation; in this way, apart from economy in the use of fat or oil, the advantage of a higher standard of cleanliness is obtained.

Yet another feature of the potato chip dispensing apparatus according to the invention consists in the provision of a salt dispensing device which, by means of a selection dial or a control button externally provided on the apparatus, can either be made effective or ineffective, according to the buyer's wish, the additional advantage being obtained, that improper actuation of said salt dispensing device becomes impossible.

The apparatus according to the invention, which provides all aforementioned as well as other features, mainly comprises: an enclosure divided in at least two separate chambers, viz. a ventilated and/or cooled storage chamber and a frying chamber; located in said ventilated and/or cooled storage chamber, a storage drum having perforated walls; conveying means for successively transfering quantities of potato chips from said storage drum to a weighing device so as to assemble a predetermined weight of potato chips thereon; means for transfering said weighed-out portion of potato chips from said ventilated and/or cooled storage chamber to said frying chamber, more specifically into the frying basket; means for liberating, for each portion of fried potato chips, a dish from a stack of such dishes; means for pouring a portion of fried potato chips into said dish, and means controlled by the user, for strewing a measured quantity of salt on said fried potato chips.

In order that the different features of the present invention be more clearly understood, a preferred embodiment of the apparatus according to the invention will be described more in detail hereinafter, with reference to the accompanying drawings, in which:

FIG. 1 schematically shows a front view, with the front panel removed, of a potato chip dispensing apparatus according to the invention;

FIG. 2, 3 and 4 show cross-sectional views according to the broken lines II—II, III—III and IV—IV, respectively, in FIG. 1;

FIG. 5 shows a schematic front view of the driving motions pertaining to the weighing device and the frying basket, respectively;

FIG. 6 shows a view according to the arrow F6 in FIG. 5;

FIG. 7 shows a view similar to FIG. 5, with the weighing device in the waiting position and the frying basket in the tipped position;

FIG. 8 is a view according to the arrow F8 in FIG. 7;

FIG. 9 shows a vertical sectional view of the salt distributing device of the potato chip dispensing apparatus;

FIG. 10 is a view similar to FIG. 9, but with the salt distributing device in the working position;

FIG. 11 is a diagrammatic sectional view according to the line XI—XI in FIG. 10.

As represented in the accompanying drawings the potato chip dispensing apparatus mainly comprises an enclosure 1 housing the various parts and sub-systems of the apparatus, said enclosure being divided into two main compartment 2 and 3 respectively. In compartment 2 the storage drum 4 made of perforated plastic, metal or similar material is rotatably mounted according to a downwards sloping axis; suitably located on the peripheral surface of said drum 4 there is provided, as indicated at 5, a removable cover which covers an opening through which a certain quantity of cut and sliced potatoes, which may have been subjected to a preliminary frying treatment, can be introduced into the storage drum 4.

The drum 4, rotatably mounted on bearings 6 and 7, may be rotated by a power drive unit 8. On the journal 9 of the drum 4 is mounted a disc 10 carrying, in this case, two contacts 11 and 12, suitably located for cooperating with a switch 13.

Compartment 2 is provided with an opening 14 through which it communicates with the outer air; it also communicates with the ambient air through the passage 15. Both the openings 14 and 15 may be covered by a gauze or the like in order to prevent dust or other foreign particles from penetrating into the enclosure.

In this way a free circulation of fresh air is obtained through compartment 2 and the perforated storage drum 4, whereby the potatoes contained in said drum will be well ventilated.

In case the apparatus is used in regions where temperature is always relatively high, a cooling unit can be connected to said passages 14 and 15 with a view to providing ventilation as well as cooling to said potatoes.

In one or more places, in this case on at least two places around the periphery of the storage drum 4, there is a cut-out part in the drum wall, 16 and 17 respectively, which is covered by a plate 18 projecting outward with respect to said drum and provided with side walls so as to enclose an opening, said opening being normally closed by a flap 19 which is hinged to the drum wall at 20. By means of a spring 21 each flap 19 is resiliently pressed against the free edge of the corresponding plate 18, each flap 19 being further provided with a projecting part 22 suitably located for cooperation with a stop member 23 so that, when the drum is rotated, said flaps will be opened one after the other, as their projections 22 butt against said stop member 23. These plates 18 with their side walls constitute the aforementioned "scooping receptacles" 24. In the illustrated embodiment these receptacles are provided on the outside of the drum.

In order to separate the compartments 2 and 3 from each other, preferably a plate 25 of insulating material is used so as to prevent the heat produced in compartment 3 from penetrating into compartment 2.

An opening 26 in said partitioning plate 25 is covered by means of a hatch or trap 27 turning upon a hinge 28 which is fixed with respect to the frame work or enclosure 1; said trap carries a collecting receptacle 29, the latter being fixed on one side on said trap 27 by means of a hinge 30, whereas on the opposite side said receptacle has a projecting L-shaped member 31, which cooperates with an L-shaped stop member 32, the latter being fixed on said trap 27, in such a way that said receptacle is capable of a slight oscillating movement around said hinge 30, said movement being limited by said stop member 32. Integral with said receptacle 29 there is provided a projecting step or spindle 33 on which a weight 34 is adjustably mounted, as well as a projection 35 suitably located for cooperation with the free end of a lever 36. The latter, which is pivoted as at 37 on the partition plate 25, has a projecting part 38 suitably located for cooperating with a pressure switch 39.

With its lower surface said trap 27 rests on a roller 40 provided at the end of a lever 41 which at 42 is pivoted on a fixed bracket 43, and the other end of which is rotatably connected to a second lever 45. The latter, at 46, is pivoted to a third lever 47, which at 48 is rotatably mounted on a part in fixed relationship to the framework or enclosure 1, whereas at its free end, said lever 47 is provided with a roller 49 which rests against the edge of a cam 50, said cam being suitably controlled by a power drive unit 51.

In said compartment 3 there is also provided a frying pan or cauldron 52 filled with oil or fat, said pan being kept, by suitable heating means such as electrical resistances, at a constant temperature. Above said pan or cauldron 52 there is provided a frying basket 53 mounted on a shaft 54.

Also fixed on said shaft 54 is a crank or lever 55 which, my means of a pivot 56 is rotatably connected to a second lever 57, the latter being connected, by means of a pivot 58, to a third lever 59. The latter is rotatably mounted on a shaft 60 and carries at its free end a roller 61 which rides on the edge of a cam 62, said cam being mounted on the output shaft of said power drive unit 51.

The basket 53 is made of perforated sheet material; adjacent said shaft 54 this basket is formed with a plurality of parallel strip-like projections, said projections being spaced so as to determine a plurality of slots 64 between them, through which during tipping operations the liquid fat or oil can readily flow back into the cauldron 52.

Finally on said shaft 54 another crank or lever 65 is fixed, the purpose of which will appear from the description hereinafter.

In the chamber 3 there is also provided a device 66 for successively liberating dishes 67 from a stack of such dishes, said dishes being used for receiving and holding each a helping of fried potato chips. Such a device is known in se; it mainly comprises four pairs of knives, 68 and 69; in operation, one knife of each pair will be inserted between the edges of the lowest and the one but lowest dishes so as to support the stack of dishes while the lower knife of each pair of knives is moved outwards in order to drop the lowermost dish upon the bottom of the device 66. Each pair of knives is fixed upon a shaft as schematically indicated at 70, said shafts 70 being, at their top ends, in cooperative relation with generally known means 71 for producing re-

lated angular displacements of said shafts, said means not being described in detail in the present specification, and being capable of being driven in any appropriate way, e.g., by a separate motor, in such a way that after a valid coin has been inserted into the slot, the shafts are rotated through one complete revolution whereby one dish is dropped. Said dish will then drop down e.g., on a grid-like structure **72**, whereby any potato chips that might drop beside the dish will fall through the grid, to be collected in a receptacle which has the shape of a drawer **73**.

The casing of the device **66** has at the front side an opening **74** provided therein, through which the buyer can obtain access to the dish **67** for removing said dish from the dispensing apparatus, whereas in the back wall of said casing an opening **75** is provided into which the lower end of a funnel **76** debouches. The open upper end of said funnel **76** is disposed so as to receive the contents of said basket **53**, when the latter is tipped over, said contents being thus guided through said opening **75** towards the dish **67**. Adjacent the device **66** and fixed, according to the present example, upon the outer casing there of, two supports **77–78** are provided; one of said supports, **77**, carries a cup-shaped receptacle **80** rotatably fixed thereon by means of a spindle **79**, said receptacle normally resting against said second support **78**.

In the bottom of said cup-shaped receptacle **80** an opening **81** is provided; between said bottom and a second bottom **84** fixed thereunder and having a similar opening **85** provided in the center thereof, there is a sliding part **82** provided with an opening **83**. Externally with respect to said receptacle, said sliding part **82** is formed with a transversally extending part **86**, a spring **87** being provided to maintain said sliding part in the position illustrated in FIG. **9**.

Through cooperation with said transversally projecting part **86**, said lever **65** is capable of pushing said sliding part **82** and causing it, against the pressure of the spring **87**, to slide inwards so as to bring said openings **81—83** and **85** into alignment with respect to each other. Preferably the shaft **79** extends through the enclosure of the apparatus so as to be accessible from the outside, the outward projecting end of said shaft being provided with a button or knob, whereby said receptacle **80** can be manipulated so as to move it from the position shown in full lines in FIG. **9** to the position as indicated in dash-dot-lines or vice versa. This receptacle constitutes the so-called salt distributing device. With the aid of the aforementioned control knob it is possible, according to wish, either to provide or stop the supply of salt to the fried potato chips.

Underneath the lower bottom **84** of the receptacle **80** a tube **88** is provided which through a laterally deflecting part debouches into an opening **89** provided in the casing of the device **66**.

The operation and the use of the apparatus as described hereinbefore will be readily understood from the following description:

Before the apparatus is properly put into operation a supply of cut and sliced potatoes, which may have been subjected to a preliminary frying treatment, is introduced through the aforesaid cover **5** into the storage drum **4**; said potatoes are continually ventilated and/or subjected to cooling, due to the use of perforated sheet material for the drum **4**, and due to said openings **14** and **15** providing communication with the outside air. The use of insulating material for the partition wall **25** ensures adequate protection of the compartment containing the drum **4** against the heat produced in the chamber **3**. When the apparatus is connected to the electrical supply main, the motor **8** starts to drive the drum **4**.

During the rotation of the drum **4** the potato chips contained therein are scooped and carried upwards by the receptacles **24**; each time one such receptacle passes above the collecting vessel **29**, the flap **19** of said scooping receptacle **24** is opened as soon as the projecting part **22** thereof butts against the stop member **23**. In this way each scooping receptacle **24**, as it passes above the collecting vessel **29**, discharges its load of potato chips into said vessel **29**. The rotation of the drum **4** continues until the weight of the potato chips discharged exceeds a certain value. As soon as this happens, the projection **35** will lower the lever **36**, causing the switch member **39** to be actuated.

The operation of the switch **39** causes the switch **13** to shut out the motor through one of the contacts, **11–12**, so as to arrest the drum in the position shown in FIG. **1**.

It will be understood that when two receptacles such as **24** are provided, said disc **10** will carry two contacts such as **11–12**. When a plurality of such receptacles are used, spaced along the periphery of the drum, an equal number of contacts will be provided, spaced along the periphery of said disc **10**, so as to make sure that the drum will always be arrested in the proper position. At this time the dispensing apparatus is in the waiting position.

If at this time a buyer wants to procure a helping of fried potato chips it suffices to insert, e.g., through a slot **90**, one or more coins into the apparatus, in order that a coin mechanism, known per se, as schematically indicated at **91**, starts up the motor **51**, causing it to drive the cam members **50** and **62**.

The rotation of the cam member **50** causes the flap **27** to swing downwards around its shaft **28** so as to drop the potato chips contained therein into the basket **53**.

At the same time the rotation of the cam member **62** causes said frying basket to be lifted free from the liquid fat or oil, while the flap **27** is swinging down, in order to avoid splashing of said fat or oil. Also at this time the dish liberating motion of said device **66** is suitably driven so as to liberate one dish from the stack of dishes, and to place said dish in position on said grid structure **72**.

After the potato chips have been placed in said frying basket, the latter is lowered again into the liquid, while the flap **27** is raised again into its horizontal position, whereby e.g., by means of another switch, not shown in the drawings, the drum is driven again and continues rotating until the switch **39** is again actuated.

During a predetermined time, which is controlled by means of an adequate adjustable timing mechanism, the frying basket **53** remains immersed in the frying oil or fat, whereupon the motor **51** is again switched in.

This now results in the frying basket **53** being lifted and tipped over around the axis **54**, so as to drop the fried potatoes through the funnel **76** and the opening **75** into the dish **67**.

During the tipping over the lever **65** of the frying basket **53** butts against the sliding member **82** of the salt distributing device so as to move said sliding member into the position shown in FIG. **10**, thus causing a predetermined quantity of salt to be dropped through the aligned openings **81–83–85** into the tube **88**, whereby said fried potatoes in said dish **67** are provided with seasoning. This, of course, will only happen if the salt distributor is in the position as shown in full lines in FIG. **9**.

At this moment the cycle of operation is terminated.

It is to be understood that the present invention is by no means restricted to the embodiment described as an example, but that such potato chip dispensing apparatus can be realized in many different shapes and dimensions without departing from the scope of the invention.

What we claim is:

1. An apparatus for dispensing potato chips, said apparatus comprising means forming an enclosure subdivided at least into an upper storage chamber for unfried potato chips and a lower frying chamber, at least one heat insulating partition wall extending between said chambers and separating them, said wall having an opening, a pivotable flap closing said opening, a weighing device in said storage chamber, said weighing device having a collecting receptacle, said pivotable flap closing the bottom of said collecting receptacle, a perforated storage drum in said storage chamber, at least one scooping receptacle located along the periphery of said drum, means transmitting potato chips from said scooping receptacle to said collecting receptacle, said weighing device being adapted to pivot said flap when a predetermined quantity of potato chips is located in said collecting receptacle, a pivotable frying basket mounted below said flap in said frying chamber, said frying chamber having a location for receiving a dish, means pivoting said basket to discharge a quantity of fried potato chips upon said location, said frying chamber having a passage communicating with said location, a salt distributing device connected with said passage, a shutting member for closing said passage, and a control member connected with said basket and cooperating with said shutting member to free said passage when said basket is pivoted to its discharge position.

2. An apparatus in accordance with claim **1**, wherein said storage chamber has openings communicating with outside air.

3. An apparatus in accordance with claim **1**, having a plurality of scooping receptacles which are equally spaced along the periphery of said drum.

4. An apparatus in accordance with claim **1**, wherein said frying basket has a plurality of openings located in that part of its rim which is lowest when the basket is in its discharge position.

5. An apparatus in accordance with claim **1**, comprising a knob connected with said salt distributing device for moving said salt distributing device out of cooperation with said control member.

* * * * *