(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 725 560 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.04.2014 Bulletin 2014/18

(21) Application number: **13190227.2**

(22) Date of filing: **25.10.2013**

(51) Int Cl.:
G07F 17/00 *(2006.01)* ***G07F 11/54*** *(2006.01)*
G07F 11/58 *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **25.10.2012 IT MI20120382 U**

(71) Applicants:
- **Arnoldi, Luca**
  24125 Bergamo (IT)
- **Pezzica, Paolo**
  54033 Marina di Carrara (MS) (IT)
- **Teruzzi, Filippo**
  19021 Arcola (SP) (IT)

(72) Inventors:
- **Arnoldi, Luca**
  24125 Bergamo (IT)
- **Pezzica, Paolo**
  54033 Marina di Carrara (MS) (IT)
- **Teruzzi, Filippo**
  19021 Arcola (SP) (IT)

(74) Representative: **Cicogna, Franco**
Ufficio Internazionale Brevetti
Dott.Prof. Franco Cicogna
Via Visconti di Modrone, 14/A
20122 Milano (IT)

(54) Automatic bread dispenser, in particular a French loaf dispenser

(57) An automatic bread dispenser, in particular for dispensing French loaves, comprises a dispenser holding body including at least a pre-delivery region, consisting of one or more shelf elements, wherein said French loaves are loaded in the holding body and held under controlled temperature and moisture conditions; said pre-delivery region being separated and insulated from a bottom delivery region. The dispenser may also comprise a top preserving region, consisting of one or more shelf elements, in which the French loaves are loaded and preserved; said top preserving region being separated and insulated from the pre-delivery region.

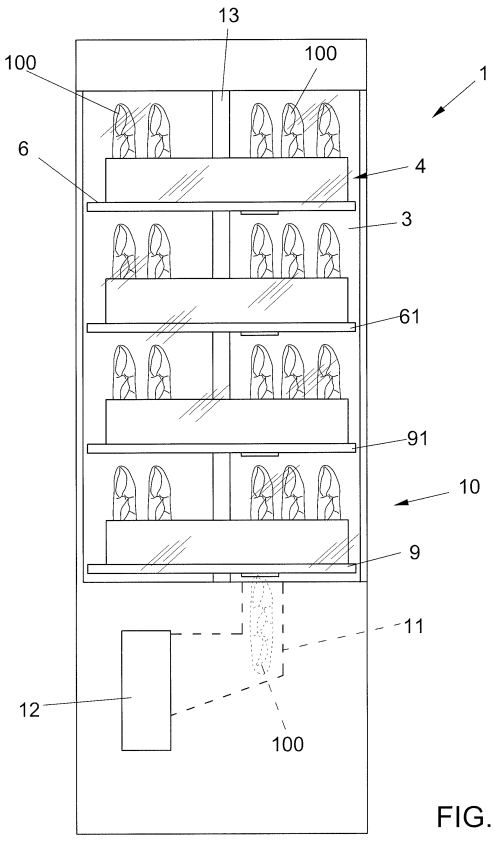


FIG.1

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to an automatic bread dispenser, in particular a French loaf dispenser.

[0002] As is known, delivery of bread in French loaf forms, made starting from frozen French loaves or a preset mixture packaged with all the components necessary for baking the French loaves, with the exception of water and cooking heat, is a continuously increasing market.

[0003] The frozen French loaves or pre-mixtures are prepared by industrial bread makers, supplying them to a storekeeper.

[0004] The latter may be either a baker or a private or public run firm, cooking the French loaves and individually packaging them in plasticized bags having a front clear portion.

SUMMARY OF THE INVENTION

[0005] The aim of the present invention is to provide such a French loaf automatic dispenser adapted to greatly reduce the length of the industrial supply chain while qualitatively standardizing the bread product properties.

[0006] Within the scope of the above mentioned aim, a main object of the invention is to provide such an automatic bread dispenser allowing to greatly reduce the fixed managing cost of conventional bread dispenser and selling systems.

[0007] Another object of the present invention is to provide such an automatic bread dispenser providing a consumer with bread products in a ready condition, to be consumed at any time of the day and at any place.

[0008] Another object of the present invention is to provide such an automatic bread dispenser improving the bread selling performance.

[0009] Yet another object of the present invention is to provide such an automatic bread dispenser which, owing to its specifically designed constructional features, is very reliable and safe in operation.

[0010] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an automatic bread dispenser, in particular for dispensing French loaves, **characterized in that** said dispenser comprises a holding body including at least a pre-delivery region, consisting of one or more shelf elements, wherein French loaves are loaded in said holding body and are held under controlled temperature and moisture conditions.

[0011] Said pre-delivery region is separated and insulated from a bottom delivery region.

[0012] The automatic bread dispenser according to the present invention may also comprise a top preserving region, consisting of one or more shelf elements, in which said French loaves are loaded and preserved.

[0013] Said top preserving region is separated and insulated from the pre-delivery region.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the invention, which is illustrated, by way of an indicative but not limitative example, in the accompanying drawings, where:

Figure 1 is a front elevation view of an automatic bread dispenser, of a vertically loaded cylindric type, according to the present invention;

Figure 2 is a further front elevation view, of a partially seen-through type, showing the automatic bread dispenser of Figure 1;

Figure 3 is a partially seen-through top plan view of the bread dispenser of Figures 1 and 2;

Figure 4 is a view similar to Figure 3, showing the bread dispenser loaded with a bread amount;

Figure 5 is a front elevation view of an automatic bread dispenser of a horizontally loaded parallelepiped type, according to the present invention;

Figure 6 is a partially cross-sectioned side elevation view of the bread dispenser of Figure 5, comprising a plurality of bread trays including screw pushing assemblies; and

Figure 7 is a further partially cross-sectioned side elevation view of the bread dispenser with a plurality of bread trays including corresponding feeding tracks.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] With reference to the number references of the above mentioned figures, the automatic bread dispenser, in particular for dispensing French loaves, according to the present invention, which has been generally indicated by the reference number 1, comprises either a cylindric dispenser body 2, or a parallelepiped dispenser body 22, made of a metal or plastics material, to be supported on the ground or a floor.

[0016] More specifically, the cylindric body 2 comprises a large size circular window arrangement 3, allowing to see the bread products or French loaves to be dispensed.

[0017] The parallelepiped body 22 comprises a like large size window arrangement 33, of a rectangular or semicircular shape.

[0018] Said window arrangement is preferably arranged at the top of the bread dispenser.

[0019] Both the cylindric body 2 and parallelepiped body 22 are divided into three inner regions.

[0020] According to a first embodiment of the bread dispenser, the cylindric body 2 is loaded with vertically arranged French loaves, at a top region 4 through a load-

ing door 5 arranged on the back of the cylindric body 2.

[0021] The top region 4 is held at a preserving temperature of +4°C.

[0022] Said top region 4 comprises moreover a top rotary disc element 6 including a scroll channel in which a plurality of French loaves 100 are arranged.

[0023] Said scroll channel 7 extends from the outside to the inside, and the French loaves, or French half-loaves, 100 are vertically arranged and are so fed as to fill-in said top disc element 6.

[0024] Then, the fed French loaves 100 arrive at a hole 8 having an automatically controlled horizontal guillotine opening.

[0025] The French loaves 100 fall, under gravity, through the hole 8 on a middle disc element 9, arranged at a middle region 10 of the automatic bread dispenser, under a controlled moisture and temperature environment.

[0026] Each said rotary disc element 6 and 9 comprises an insulating layer for providing desired temperature areas.

[0027] In the embodiment herein shown, the top region 4 and middle region 10 are both constituted by two rotary disc elements indicated by the reference numbers 6 and 61, 9 and 91, respectively.

[0028] More specifically, the middle disc element 9 arranged at the bottom of the middle region 10 comprises a scroll channel analogous to that of the other disc elements, thereby the French loaves 100 are able of sliding to said horizontal guillotine opening or door.

[0029] Upon payment, the French loaves 100, through the opening of the diaphragm arranged at the middle region 10 of the bread dispenser, will vertically fall, under gravity, into a small heating cylindric space 11, providing a combined microwave and IR heating of the French loaves, and, at the end of the heating, to a following dispensing space 12 from which a user may withdraw the desired cooked French loaves.

[0030] Depending on the height of the automatic bread dispenser, the disc element arrangement of the preserving region (either of a negative type or at +4°C) can comprise two disc elements and a corresponding number at the middle pre-delivery region, as in the embodiment herein shown.

[0031] Thus, the automatic bread dispenser will contain a sufficient number of French loaves as to provide a truly economic system.

[0032] A compressor assembly is moreover arranged in the bottom portion of the bread dispenser, at a third region, not shown in the Figures.

[0033] Said third region also comprises the microwave and IR heating assembly as well as a space for delivery the French loaves to a customer.

[0034] Owing to a provision of a channel centrally arranged with respect to the system, that is near a disc element pivot pin 13, cold air is delivered to the top portion of the dispenser, whereas the cooling heat of the refrigerating compressor is directed to the bread dispenser central portion to properly control the environment temperature.

[0035] The quick heating step recovering air is also so conveyed as to hold at a desired value, if necessary, the temperature of the pre-delivery middle region.

[0036] In the embodiment of the cylindric bread dispenser 22 designed for backer applications, both the top region and the central region are under controlled temperature and moisture conditions, that is at +25-30°C while the preserving region at +4°C being absent.

[0037] Even in this case, are herein provided two rotary disc elements, or a larger number, depending on the height of the body of the automatic bread dispenser.

[0038] In a further embodiment of the bread dispenser, shown in Figures 5-7, the parallelepiped body 22 is designed for receiving the French loaves 100 in a horizontal position thereof.

[0039] More specifically, said parallelepiped body 22 comprises a plurality of inner bread trays 66, on which the French loaves 100 are horizontally slidingly displaced, and being loaded thereon through the front window arrangement opening 33.

[0040] Also in this case, three operating regions are herein provided: a top preserving region having a negative temperature or a +4°C temperature, comprising, for example, the top trays; a pre-delivery region having controlled temperature and moisture conditions, at +25-30°C, for example with two or more middle trays; and a bottom region with the housing space for the compressor, a quick microwave and IR heating assembly and a related withdrawing area.

[0041] In this bread dispenser embodiment, a customer may request that bread be delivered even without the quick heating step, for example to bring the taken French loaves to his/her home to be consumed later, since the bread of this embodiment is fully cooked by the baker.

[0042] According to the embodiment shown in Figure 6, the trays 66 comprise a plurality of endless screw pushing assemblies 16, for automatically pushing the bread loaves 100 from a top tray to a bottom tray, under gravity, owing to the provision of a gap 17 arranged between the shelf elements 66 and the front clear door 33.

[0043] Each said shelf element comprises a movable diaphragm 18, arranged at said gap.

[0044] Alternately, to increase the bread contents of the automatic bread dispenser, said bread trays can comprise, for each channel in which the packaged bread slides, a pair of feeding tracks 20, shown in Figure 7, causing the French loaves 100 to horizontally slide.

[0045] Said sliding tracks 20 are driven by the weight of the bread that, in a supported condition, is fed toward the gap 17, from which it will fall onto the bottom plane.

[0046] Moreover, said movable tracks moving through the top portion of the tray, rotate in an opposite direction in the bottom portion of said tray, thereby affecting the top of the bread to facilitate its conveying and feeding in the bottom tray.

[0047] In this case, the bottom tray is offset and com-

prises the gap 21 directed toward the bottom of the automatic dispenser, so as to provide a "S" shaped circulating circuit.

[0048] The automatic bread dispenser according to the present invention can be advantageously used both for generally distributing bread and for distributing said bread to selling bakers.

[0049] The general or main distributing mode of operation comprises an industrial bread maker making frozen bread products for supermarket or vending-selling arrangements, storing said frozen bread products and loading them on an automatic A-type bread dispenser, that is including a preserving region at +4°C.

[0050] This distributing mode of operation is provided for larger urban centers, where the inventive automatic bread dispensers are arranged near underground, railway and tramway stations, newsstands, squares, hospitals, outside of trading centers, and so on.

[0051] The baker mode of operation comprises industrial frozen and/or premix bread makers and bread dealers supplying the frozen bread or premix to the bakers.

[0052] In particular, a baker will bake (in the case of a premix) or thaw out the frozen bread and will complete its cooking (in the case of pre-cooked frozen bread), and the inventive automatic bread dispenser will delivery it (a B-type with the bread loaded at environment temperature).

[0053] This delivery mode of operation is provided for small inhabited places and allows bakers to greatly reduce their fixed costs for rents, employees and so on, while increasing the selling volumes, by optionally arranging their automatic dispensers at an area near competitors, newsstands, schools, hospitals, squares and so on.

[0054] In the general distribution mode of operation, the industrial bread makers provide a nearly completely precooked bread product, and freeze and individually package it.

[0055] In this case, the bread cooking is nearly complete since, at the end of the operating cycle, the automatic bread dispenser will complete the bread cooking in few seconds.

[0056] In particular, the bread maker will supply to a bread dealer, either of public or private type, a vending, a supermarket chain and so on, the frozen bread boxes stored by the dealer in refrigerating places.

[0057] Depending on requirements, the dealer will transfer bread from the refrigerating place to a natural defrosting place, at +4°C.

[0058] This operating step may be directly carried out in a bread feeding van, for loading the automatic bread dispensers with bread in a frozen condition.

[0059] The pre-cooked bread product, at a temperature of +4°C, is loaded in an A-type automatic bread dispenser, including a top region for holding the bread at +4°C, by a refrigerating assembly.

[0060] At this temperature, bread is preserved for a period larger than 24 hours, while holding its fragrance and freshness characteristics.

[0061] It is also possible to load frozen bread into a bread dispenser including its top region at a negative temperature for increasing the bread preserving capability in scarcely inhabited areas and with a high bread product recirculation.

[0062] In particular, the A-type automatic bread dispenser automatically controls, depending on the bread amount present therein, the transfer from the +4°C temperature holding zone to a controlled temperature and moisture lower zone, with a temperature of 25-30°C (the pre-delivery zone or region).

[0063] Both the above regions comprise window arrangements allowing a customer to see the bread product.

[0064] Furthermore, said regions are separated by a thermally insulating layer arranged under a rotary arrangement, separating and holding different temperatures in the two regions.

[0065] Finally, as the bread product is withdrawn by the customer, said bread product or half French loaves fall into the last automatic dispenser stage, which cannot be seen from outside, and slide through a quick heating tube with a built-in microwave heating system (for cooking the bread from inside) and an IR system (for cooking the bread crust), and which, in about 10 seconds, will heat the bread.

[0066] Finally, the bread is transferred to the delivery space.

[0067] In the middle delivery channel, the industrial bread maker will introduce the bread premix and/or precooked bread at 60-70% and will freeze it.

[0068] In this case, the bread cooking is not complete, since, during this operating cycle, the cooking will be completed in the baker oven.

[0069] Thus, the bread maker will supply to the intermediate public or private dealer the premix or frozen precooked bread boxes to be stored in refrigerating places by the dealer.

[0070] Based on the baker requirements, the intermediate dealer will load his delivery vans, and supply the premix or frozen bread to the baker who will store it.

[0071] Then, the baker, based on his requirements, will complete the bread making starting from the premix or will thaw out the frozen bread and put it in his oven to complete the cooking.

[0072] At the end of the cooking step, the baker packages the cooked bread, and performs an operating journey for loading the B-type automatic bread dispensers in which the bread is cooked in a fresh condition at environment temperature (without the region for holding it at +4°C) and including two regions for holding the bread under a controlled temperature and moisture condition, that is at a temperature of +25-30°C, both said regions including window arrangements for allowing a customer to see the product.

[0073] Finally, as the bread is withdrawn by the customer, the bread falls into the last automatic dispenser

stage, not seen from outside, and slides through a quick heating tube including a microwave heating system (for cooking from inside) and a further IR cooking system (for cooking the bread crust), said combined cooking system being so designed that in a period of about 10 seconds the bread is properly heated.

[0074] Finally, the bread is sent to the delivery space, at which stage a customer can select a delivery mode without final heating, in case he/she prefers to take the bread to home.

[0075] It has been found that the invention fully achieves the intended aim and objects.

[0076] In practicing the invention, the used materials, as well as the contingent size and shapes can be any, depending on requirements.

Claims

1. An automatic bread dispenser, in particular for dispensing French loaves, **characterized in that** said dispenser comprises a holding body including at least a pre-delivery region, consisting of one or more shelf elements, wherein said French loaves are loaded in said holding body and held under controlled temperature and moisture conditions, said pre-delivery region being separated and insulated from a bottom bread delivery region.

2. An automatic bread dispenser, according to claim 1, **characterized in that** said dispenser comprises a preserving top preserving region, consisting of one or more shelf elements, in which said French loaves are loaded and preserved; said preserving top region being separated and insulated from said pre-delivery region.

3. An automatic bread dispenser, according to claim 2, **characterized in that** said preserving top region is held either at a preserving temperature of +4°C or at a negative temperature.

4. An automatic bread dispenser, according to claim 1, **characterized in that** said pre-delivery region is held at a temperature from +25°C to +30°C.

5. An automatic bread dispenser, according to claim 1, **characterized in that** said bottom delivery region comprises a housing space for a compressor, a microwave and infrared quick heating assembly and a bread withdrawing area.

6. An automatic bread dispenser, according to one or more of the preceding claims, **characterized in that** each said shelf element is adapted to support a plurality of French loaves which are movable on said shelf element from a loading point to an unloading point from which said French loaves fall, under gravity, into an underlying region.

7. An automatic bread dispenser, according to one or more of the preceding claims, **characterized in that** said withdrawing region comprises a heating space, of a microwave and infrared combined type, and, at the end of the cooking, a following bread taking or withdrawing space from which a user can take the French loaves.

8. An automatic bread dispenser, according to claim 1, **characterized in that** each said shelf element consists of a rotary disc element and includes a scroll channel in which said French loaves are arranged, said scroll channel extending from outside to inside, and said French loves, being vertically arranged, are fed to fill said rotary disc thereby, as said French loaves are fed, they arrive at a hole, including an automatically controlled guillotine horizontal opening door; said French loaves falling, under gravity, through said hole onto a bottom disc element or in the delivery region.

9. An automatic bread dispenser, according to claim 8, **characterized in that** said dispenser further comprises a central channel, arranged near a disc element pivot pin; cool air being conveyed from a top portion of the dispenser, whereas the refrigerating compressor cooling heat is conveyed to a central portion of said dispenser to control the temperature therein; the quick heating recovery air being also conveyed to hold, if required, a set temperature in the pre-delivery middle region.

10. An automatic bread dispenser, according to claim 1, **characterized in that** each said shelf element comprises a tray on which the French loaves are caused to slide from a loading point to an unloading point; said tray comprising an endless screw pusher element pushing said French loaves to a gap, formed between a shelf element and a dispenser body wall, through which said French loaves fall into an underlying tray or into the delivery region; each said shelf element comprising a movable diaphragm arranged at said gap.

11. An automatic bread dispenser, according to claim 1, **characterized in that** each said shelf element comprises a tray subdivided into channels, each of which comprises a pair of feeding tracks causing the French loaves to horizontally slide; said pair of tracks operating based on the weight of said French loaves which, by bearing thereon, are fed toward said gap formed between said shelf element and dispenser body wall, through which said French loaves fall into an underlying tray or into the delivery region; said pair of tracks moving through the top portion of the tray, while rotating in an opposite direction in the bot-

tom portion of said tray, thereby affecting the top of the French loaves to facilitate their conveying and feeding in the bottom tray; said bottom tray being offset and having said gap on an opposite portion with respect to the top tray, thereby forming a "S" circuit.

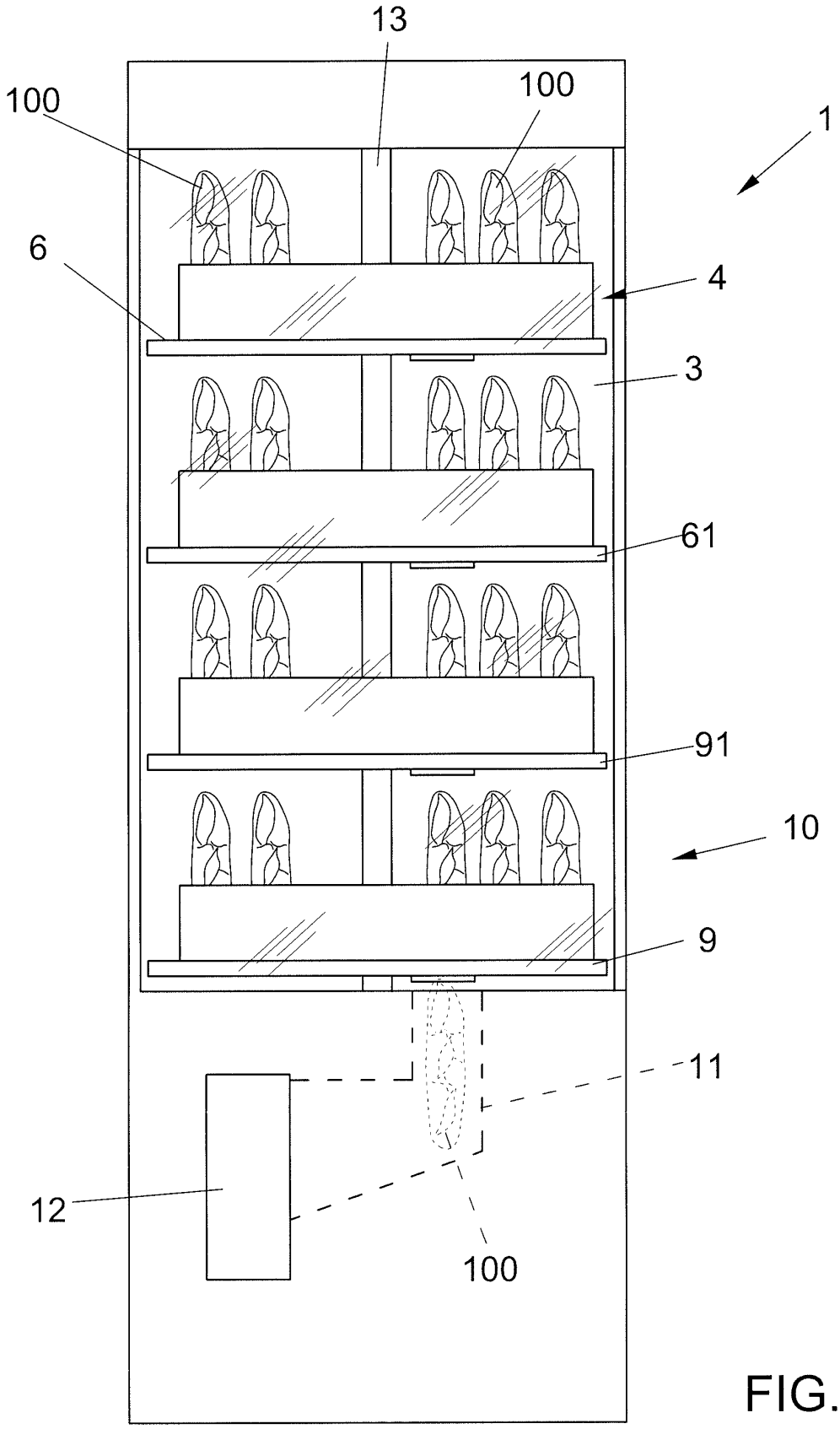


FIG.1

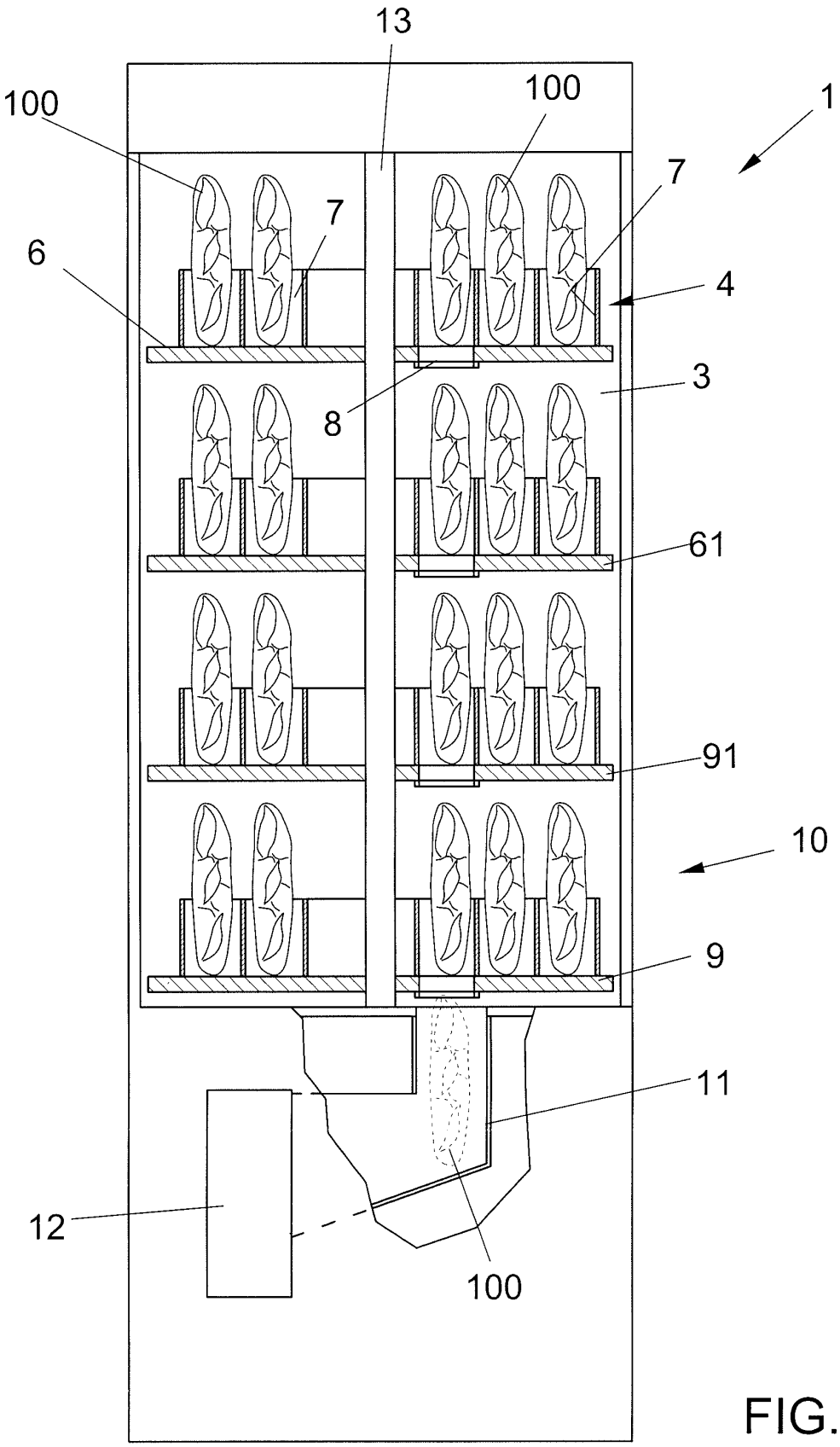


FIG.2

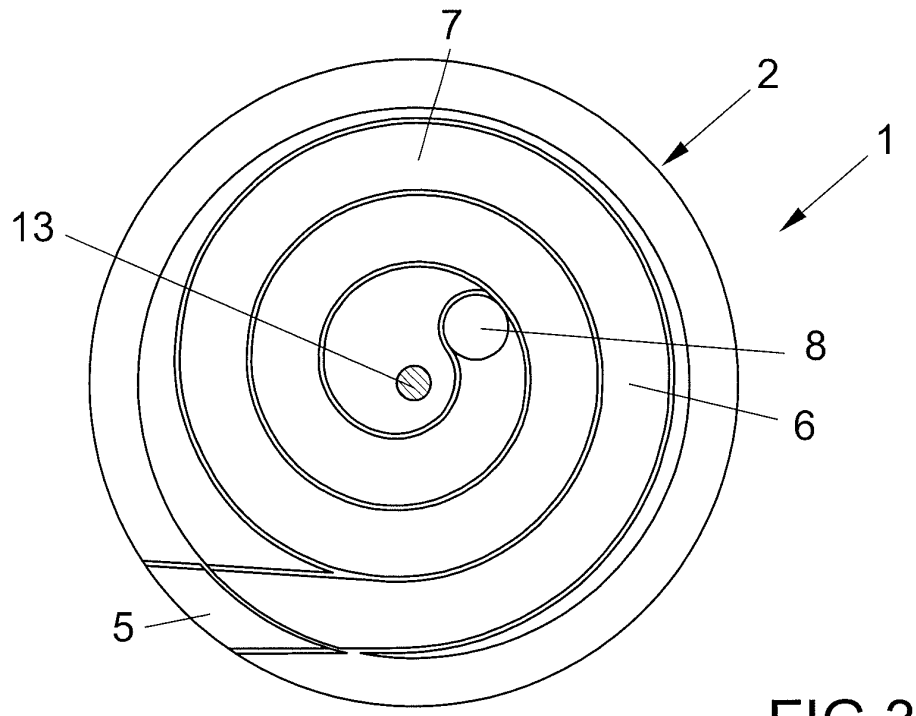


FIG.3

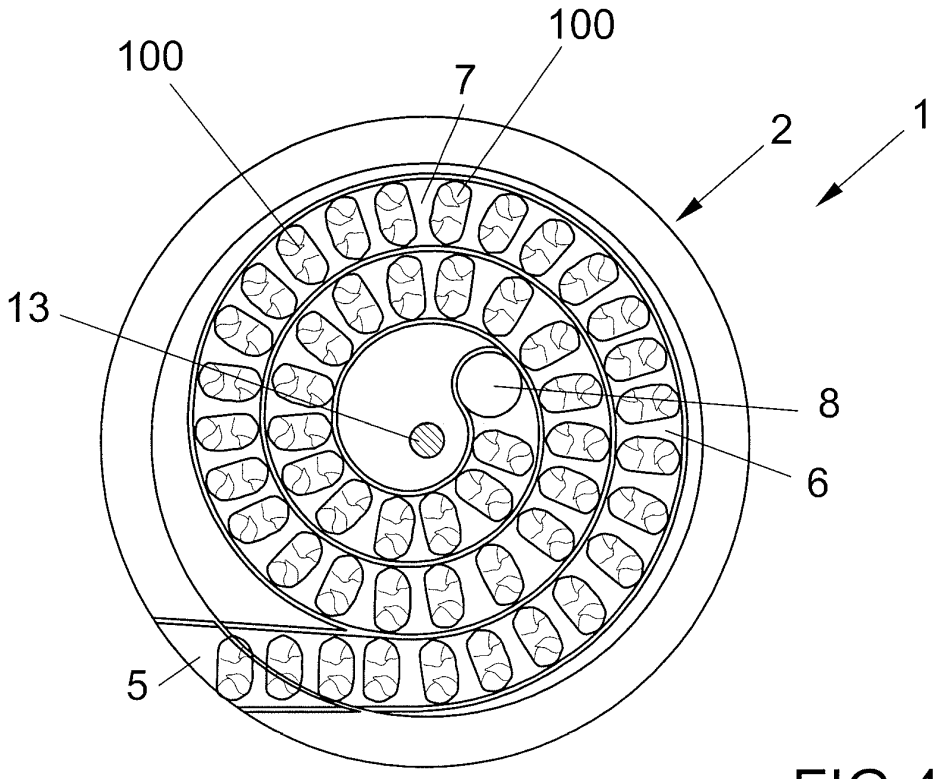


FIG.4

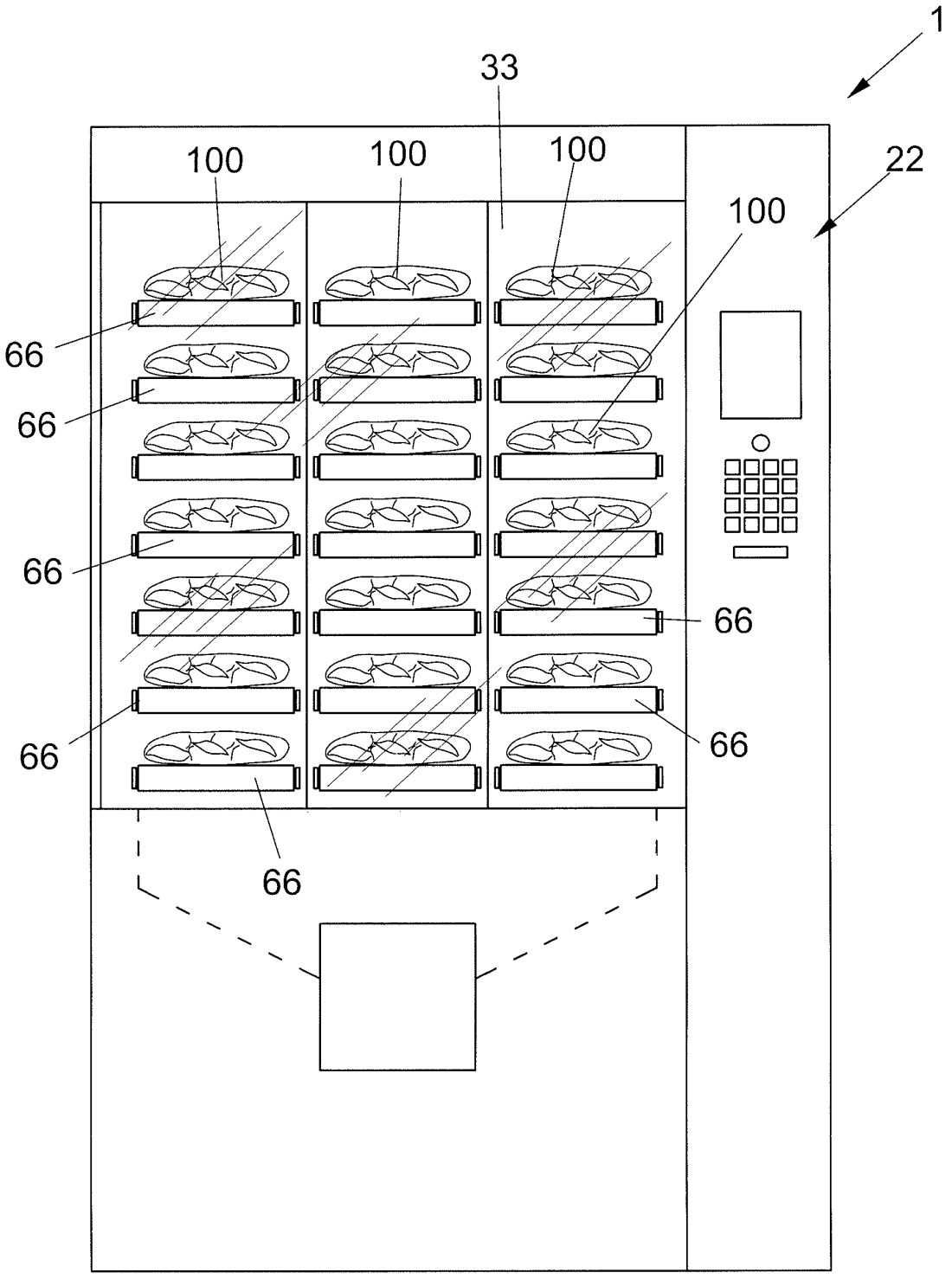


FIG.5

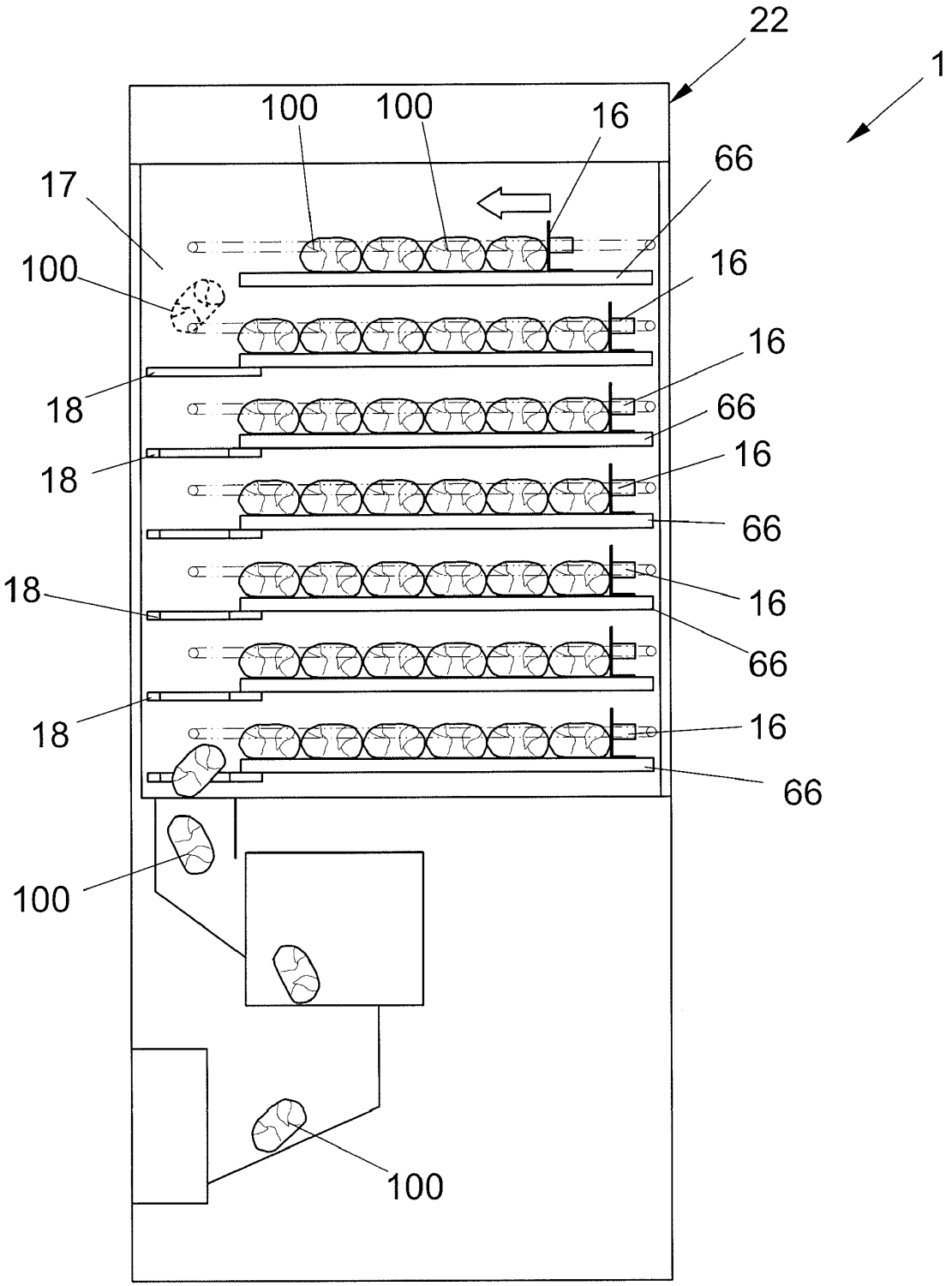

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FIG.6

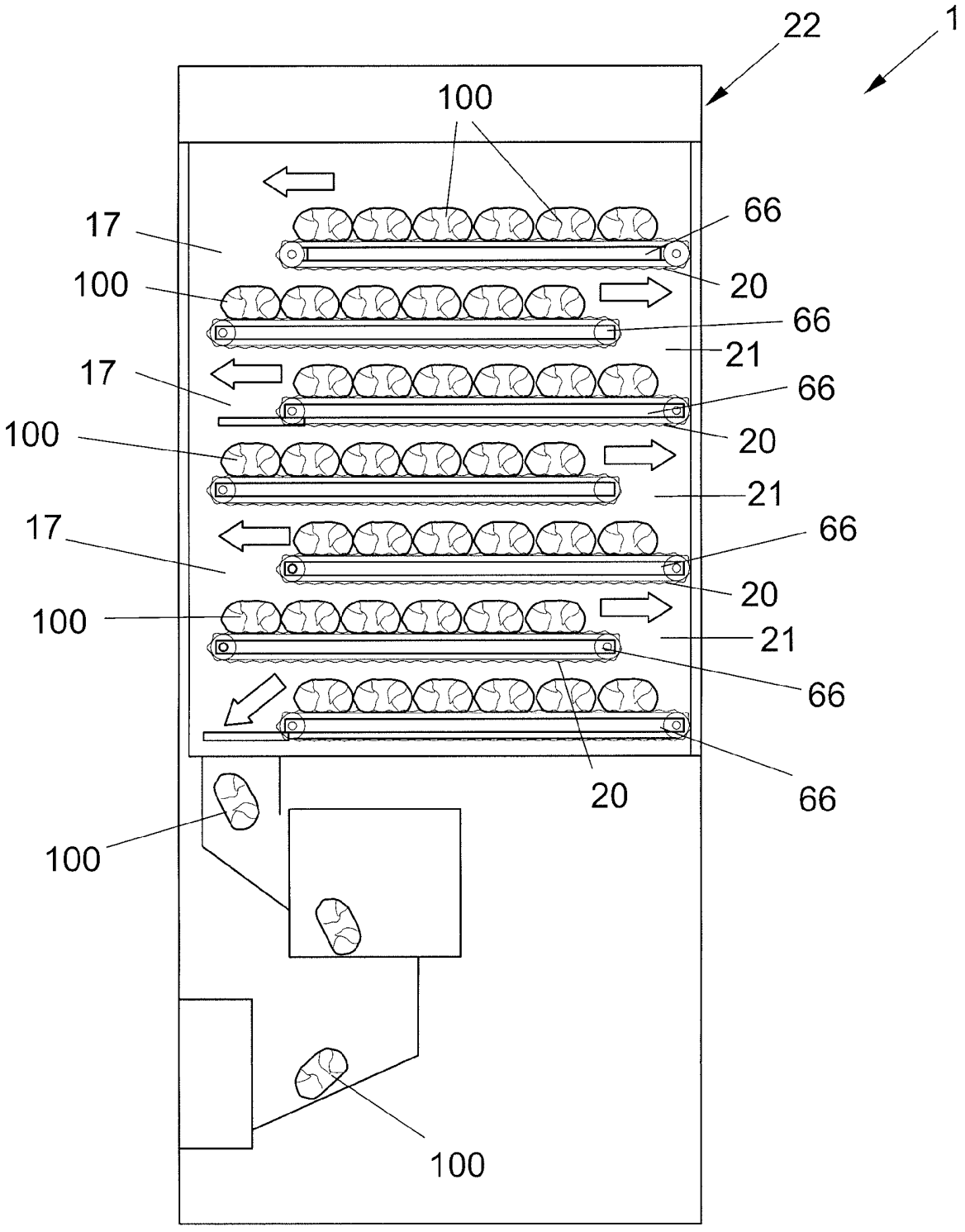

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FIG.7

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EUROPEAN SEARCH REPORT

Application Number
EP 13 19 0227

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2005 012536 A1 (WEISS VERPACKUNGSTECHNIK GMBH [DE]) 21 September 2006 (2006-09-21) * paragraphs [0011], [0032], [0034], [0035], [0037] - [0038], [0051] * * claim 6 * * figure 1 *	1-11	INV. G07F17/00 G07F11/54 G07F11/58
A	FR 2 626 757 A1 (MARY JACQUES [FR]) 11 August 1989 (1989-08-11) * page 7, line 17 - page 9, line 8 * * figures 5, 6 *	1-11	
A	FR 2 841 025 A1 (AUTOMAT & FOOD [FR]) 19 December 2003 (2003-12-19) * page 8 * * figure 3 *	1-11	
			TECHNICAL FIELDS SEARCHED (IPC) G07F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 January 2014	Spitaler, Thomas

CATEGORY OF CITED DOCUMENTS

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17-01-2014

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