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- (71) **Applicant:** TORUS PAK RESEARCH AND DEVELOPMENT S.À R.L [LU/LU]; 15, Rue Edward Steichen, 4th Floor, 2540 Luxembourg (LU).
- (72) **Inventor:** GILLBLAD, Rickard; Västra Hagenvägen, 439 92 Onsala (SE).
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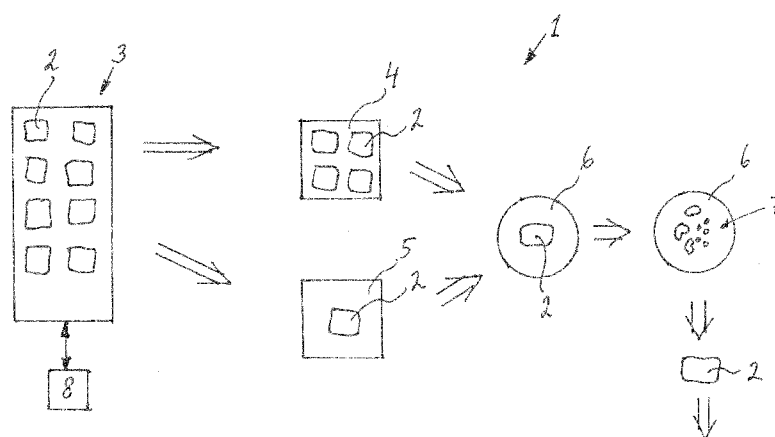


Fig. 1

(57) **Abstract:** Method for serving a hot food dish at a restaurant where each food dish is a frozen, pre-cooked food dish comprised in a food tray and stored in a freezer, where the restaurant uses a predetermined menu, where a food dish is selected from a plurality of different food dishes, where the selected food dish is heated in a heating oven, where the food tray with the heated food dish is placed on a plate, where the bottom of the food tray is removed such that the food dish comes in contact with the plate, removing the food tray, and serving the hot food dish on the plate to a customer. The advantage of the invention is that a serving method is provided, in which a hot food dish can be served without any handling of the food dish.

SERVING METHOD FOR A FOOD PRODUCT

TECHNICAL FIELD

The present invention relates to a serving method for a food product, where a frozen, pre-cooked food dish comprised in a food tray is heated
5 and served without handling of the food dish.

BACKGROUND ART

There are several requirements to fulfil in order to be allowed to serve food, e.g. in a restaurant or catering at other places. There are hygienic requirements adapted to ensure that the food is prepared and served
10 without being contaminated with bacteria and other health hazardous contaminations. There are requirements for how to handle the food products that are used to prepare a food dish, requirements for ventilation such that the restaurant and surrounding buildings are not disturbed by fumes and smell, requirements for how to handle waste, requirements for
15 storing heated pre-cooked food for catering purposes, etc.

There are also several more informal requirements that are important when serving a food dish in a restaurant or at a catering event. A cook and a chef are normally required, and more kitchen staff that prepares the food for the cook. Contact with several food suppliers is needed, and different
20 storage spaces for the different food ingredients are also needed, since all ingredients cannot be stored at the same place at the same temperature. Further, relatively large preparation surfaces are needed. Changing rooms for the personnel is required, and several kitchen utensils must to be stored and taken care of. For catering, the food must be prepared at one
25 place and then transported and served at another place.

All of these requirements make it relatively difficult to start a restaurant or a catering business, and the requirements further limits the possible locations for a restaurant. Since ventilation etc. must be available, some

locations are excluded. Even if a location could be suitable, there are high costs involved in the preparation of a restaurant location. Some of these requirements are only valid for restaurants handling food, i.e. preparing, lifting and moving warm food. Ice cream and salads which are served cold
5 does not have the same requirements as warm food. There are also different requirements when serving street foods from a street stand, where the customer is not seated, or when serving food at catering events.

There is thus a need for an improved serving method for serving a hot food dish on a plate at a restaurant or at another place, where the
10 customer can sit and be served at a table.

DISCLOSURE OF INVENTION

An object of the invention is therefore to provide an improved method for serving a hot food dish at a service point. A further object of the invention is to provide an improved system for a restaurant adapted for the serving
15 of a hot food dish on a plate.

The solution to the problem according to the invention is described in the characterizing part of claim 1 regarding the method and in claim 11 regarding the system. The other claims contain advantageous embodiments and further developments of the method and the system.

20 In a method for serving a hot food dish at a service point, the steps of; providing the service point with a predetermined menu, where the menu comprises a plurality of different food dishes, where each food dish is a frozen, pre-cooked food dish comprised in a food tray and stored in a freezer; selecting one of the plurality of different food dishes; heating the
25 selected food dish in a predetermined manner in a heating oven, such that the cooking of the food dish is completed; removing the food tray with the heated food dish from the heating oven and placing it on a plate; removing the bottom of the food tray by pulling a tab, such that the food dish comes in contact with the plate without any handling of the food dish; removing

the food tray by lifting it upwards from the plate; and serving the hot food dish on the plate to a customer are comprised.

By this first embodiment of the method according to the invention, a food serving method for a service point, such as a restaurant or a catering firm, adapted to simplify the serving of a plurality of hot food dishes on separate plates is provided. In the method, one or a plurality of a frozen, pre-cooked food dish which is stored in a freezer in the restaurant is heated and served to customers without any handling of the ready food dish. Handling of the food dish means that the food dish is touched and moved by kitchen utensils, e.g. that a frozen or heated food dish is moved from a food tray to a plate, that a food dish is compiled of food from different food trays or that a food dish is prepared completely. With the inventive serving method, no handling of the food dish is required, which allows for a more hygienic and efficient serving of a heated food dish.

The different food dishes that can be served in a service point are comprised in a pre-defined menu that is planned centrally. Several restaurants or catering firms may use the same menu. Each service point is supplied from a central storage, from which full delivery units with food dishes are delivered to the service point when required. The ratio of the different food dishes is adapted to the selected menu, such that a full delivery unit is always delivered to the service point. In this way, there will always be enough of the different food dishes comprised in the menu at the service point, such that the service point will not run out of a specific food dish.

A food dish may be heated in two different ways. If several food dishes are to be served at the same time, such as in a lunch restaurant or in a canteen, several food dishes are preferably simultaneously heated in a regeneration oven. If an additional single food dish is to be heated, it is preferred to heat the food dish in an oven using microwaves. In order to avoid handling of the food dish, it is important that the food dish is packed

in a food tray comprising a removable bottom. In this way, the frozen food dish can be heated in the food tray without the need to remove the food dish before it has thawed. It would be possible to remove a frozen food dish from a food tray without the food dish destroying the presentation of the food dish, but then the food dish must be handled. After the food dish has thawed, the presentation of the food dish will be destroyed if the food dish is removed from a food tray.

In a system for a service point, adapted for the serving of a hot food dish on a plate, where the food dish is a frozen, pre-cooked food dish comprised in a food tray and which is heated at the service point, where the service point comprises a freezer for storing frozen food dishes and at least one heating oven for heating a food dish, the object of the invention is achieved in that the heating oven is adapted to heat a food dish in a food tray, that the food tray is adapted to be placed on a plate before or after the heating, that the bottom of the food tray is adapted to be removed from the food tray such that the food dish comes in contact with the plate without handling the food dish, such that the hot food dish can be served to a customer without any handling of the food dish.

In the inventive serving system for a service point according to the invention, a hot food dish can be served on a plate in e.g. a restaurant or at a catering event without the handling of the food dish. The food dish is delivered to the service point as a frozen, pre-cooked food dish comprised in a food tray and is heated at the service point. The service point thus comprises at least one freezer for storing frozen food dishes and at least one heating oven for heating food dishes. The food dish is heated in the food tray, the food tray is placed on a plate and the bottom of the food tray is removed from the food tray after the heating, such that the food dish comes in contact with the plate without handling the food dish. The food dish can thus be served to a customer without any handling of the food dish.

In this way, a hot food dish can be served at a service point in an efficient way. The food served at the service point can further be distributed to the service point in an efficient way, and the waste at the service point can be minimized, since no additional food has to be stored or prepared at the service point. An environmental-friendly and lean food serving system is thus provided for.

BRIEF DESCRIPTION OF DRAWINGS

The invention will be described in greater detail in the following, with reference to the embodiments that are shown in the attached drawings, in which

Fig. 1 shows a schematic view of a system for serving a food dish at a service point according to the invention, and

Fig. 2 shows a schematic flow chart of the method according to the invention.

MODES FOR CARRYING OUT THE INVENTION

The embodiments of the invention with further developments described in the following are to be regarded only as examples and are in no way to limit the scope of the protection provided by the patent claims.

Fig. 1 shows a first embodiment of an inventive food serving system 1 to be used at a service point, such as a restaurant or a catering event. In the described example, a restaurant will be used as a service point. The food serving system comprises a freezer 3 in which the food trays 2 containing a frozen, pre-cooked food dish are stored. The freezer is relatively large such that it can accommodate more than one delivery unit of food trays. In order to provide an efficient serving and delivery system, the food trays are always delivered in a full delivery unit.

A delivery unit preferably corresponds to a standardized pallet. An example of a preferred standardized pallet is a standard European pallet, also referred to as a EUR-pallet, a Euro-pallet or an EPAL-pallet. The preferred types are either a full size EUR or EUR 1 (800 x 1200 mm) or a
5 half size EUR 6 (800 x 600 mm). Preferably, both the food trays and the pack units are adapted to the size of a European pallet in order to optimize the available volume. In this example, a pack unit is a carton containing two layers of food trays, where each layer contains 2 x 5 food trays, i.e. each pack unit contains 20 food trays. A full size European pallet will hold
10 540 pack units, which amounts to 10 800 food trays. If a full size European pallet is used, it is preferred that the freezer can accommodate approximately 15 000 food trays. In this way, there will always be a sufficient amount of different food dishes available when it is time to order a new delivery unit. The freezer must thus not be more or less empty
15 before a new order is placed.

The food serving system further comprises at least one heating oven. In this example, the system comprises a first oven 4 and a second oven 5. The first heating oven 4 is a regeneration oven, in which several food dishes can be gently heated at the same time. This is of advantage e.g. for
20 a lunch restaurant, when several food dishes are to be served at the same time. Such an oven can first heat the food dishes such that the food dishes will be ready cooked, and can then store the hot food dishes for some time in order to keep them warm. During the manufacture of the food dish at the food supplier, the food dish is pre-cooked to a certain amount, e.g. to
25 80%. The food dish will be ready cooked, such that the cooking of the food dish is completed, when the food dish is finally heated before serving.

The second heating oven 5 is an oven comprising microwaves, in which a single or a few food dishes can be heated in a faster heating process. The heating oven may be a combination oven using both conductive heating
30 and microwaves, or may use only microwaves for the heating. This oven is

preferred at times when a larger variety of food dishes are to be served, such as during an evening.

The food dish is preferably packed in a food tray comprising a removable bottom. With a food tray comprising a removable bottom, the frozen food
5 dish can be heated in the food tray without the need to remove the food dish before it has thawed. One advantage is that the food dish must not be handled by anyone in any of the steps of heating or serving the food dish. The food tray with the frozen food dish is placed in the selected heating oven. The food tray may be placed on a plate before the heating, the
10 same plate on which the food dish is to be served, but a more efficient usage of the heating space is obtained by not using a plate at this stage. The food dish is heated in the food tray in the selected heating oven. When the heating is ready, the food tray is removed from the heating oven and is placed on a plate 6. The bottom is removed from the food tray by
15 pulling a removal tab, either immediately after the heating or after a specific waiting time if the food dish has been heated using microwaves, such that the temperature in the food dish may stabilize.

When the bottom of the food tray is removed, the food dish inside the food tray will come into contact with the plate. The food tray with the lid can
20 now be removed upwards from the plate and can be discarded or recycled, depending on the material of the food tray. The hot food dish 7 is now ready to be served to a customer.

In this way, the food must never be handled by a person. Here, handling of a food dish means that the food dish is moved by a person, either directly
25 using gloves, or indirectly using kitchen utensils such as a spoon, a ladle, a spatula or the like. The handling of a food dish may include e.g. moving a frozen or heated food dish from a food tray to a plate, compiling a food dish of food from different food trays or preparing the food dish from raw ingredients. With the inventive serving method, no handling of the food

dish is required, which allows for a more hygienic serving of a heated food dish.

Since the food dish does not have to be handled, the requirements for the serving restaurant may be lower, depending on the legislation for that region. There are normally fairly high requirements for restaurants handling and serving hot meals, such as for ventilation, cleaning facilities, suction fans, grease separator, etc. In general, a conventional kitchen is not needed at all. This simplifies the serving of hot meals at catering events, since hot meals can be served on plates at any location.

10 Another advantage of using a food tray comprising a removable bottom is that the food dish is heated in a more reliable and even way, avoiding section where part of the food dish may be overheated or dried out. When a frozen food dish, e.g. comprising a sauce, is removed from the food tray and placed on a plate in order to be heated, a part of the sauce will flow
15 out on the plate when the sauce is thawed and becomes fluid. This part will then be subjected to excessive heating and may dry out, partly because the sauce layer will be relatively thin. The same affect will occur if a regular food tray containing a frozen food dish is opened and placed upside-down on the plate before heating. Also in this case, sauce or the
20 like will be able to flow out on the plate and be excessively heated. By keeping the complete food dish in the food tray during the complete heating process, these problems can be avoided. Heating space is also saved, since a food tray is more or less rectangular.

In a restaurant, a predefined amount of different food dishes are stored in
25 a freezer, where the amount and ratio between different food dishes corresponds to the menu used by that restaurant. The ratio between different food dishes is preferably predefined from the start, but can be adapted to the actual consumption, to the actual season, etc. It may e.g. be that a specific food dish is consumed on a specific day of the week or
30 month. In that case, the amount of that specific food dish is adapted for

that specific day and must not be available at all time. It is also possible to serve a specific "meal of the day" at a special price, or to only serve two different dishes each day for lunch, and to use the complete menu only at evenings. In any way, the ordered food dishes to the restaurant and the
5 stored food dishes at the restaurant takes account on the planned serving of different food dishes. In a hospital canteen, the menu may be based on nutrition values.

In the restaurant, different food dishes are served to customers. An ordering system 8 in the restaurant tracks the amount of different food
10 dishes used in the restaurant and keeps at the same time track of the current amount of remaining stored food dishes in the restaurant. When the amount of a food dish is below a predefined number, the ordering system places an order at an intermediate storage.

A restaurant is preferably supplied with food dishes from a distribution
15 system comprising an intelligent planning and ordering system in which the food trays are always delivered in full delivery units. The distribution system comprises a central ordering system and a menu planner, which plans a specific menu for that restaurant or for a restaurant chain in which the restaurant is a member. The central ordering system and the menu
20 planner are administrated with a program running on a computer. The distribution system will further supply the intermediate storage with a sufficient amount of different food dishes, such that a restaurant can always be supplied with a desired amount of different food dishes.

An order from the restaurant will be based on the actual amount of the
25 different food dishes of the menu. The tracking system, also run on a computer, calculates how many pack units of each food dish is required in order to fill a pallet and that is required to restore the predefined ratio of food dishes. It is also possible to order more than one pallet at the same time, but the order system will still do the same calculation. The order is
30 then placed at the intermediate storage, where the ordered amount of

different pack units with food dishes is collected and packed on the pallet for delivery to the restaurant.

The distribution system can take advantage of the specialization of various food suppliers in different regions of a continent. In this way, a restaurant
5 can be supplied with locally produced food dishes from suppliers in different parts of a continent in an efficient way. A further advantage of such a distribution system is that the transport of frozen pre-cooked food dishes requires less than half and up to a fourth of the transport volume compared to the transport volume for ingredients for the same food
10 dishes. The serving of frozen food dishes that are heated will further reduce the waste in the restaurant, since only the required amount of food will be prepared. A further advantage of the inventive system is that the detailed knowledge of the food dishes, e.g. regarding the exact components of the food dish and the allergic properties of a food dish, are
15 handled centrally, which ensures that a customer will be provided with correct information at all times. A local cook will normally not have access to all such information.

In this way, a high quality food dish can be served for a relatively low price, since cost reductions can be made in several stages of the food
20 delivery process. There is a cost reduction in the production of a food dish, since it is produced in an efficient way at a specialized producer, there is a transport cost reduction since less volume must be transported and since all deliveries uses full delivery units, and there is a storage cost reduction since frozen food can be stored for longer time periods. There is further a
25 cost reduction at the restaurant since less equipment is required, since less qualified personnel is required, since less time is required for the preparation of a food dish, since less formal requirements must be fulfilled and since there will be less waste.

One advantage of the system is that it allows for serving a plurality of
30 different food dishes at the same time, without having a proper kitchen.

During e.g. a catering event, the estimated amount of dishes is heated in a regeneration oven. This ensures that all registered customers will receive a food serving. Normally, there are always a few additional people arriving late, or registering late. This problem has previously been handled by
5 preparing a few extra food dishes. With the inventive system, the additional food dishes can be heated with the second oven, i.e. the microwave oven, which reduces food waste completely.

In the inventive serving system, it is possible to add one or more fresh constituent to the food dish, such as lettuce, a salad or a cold sauce. It
10 would also be possible to combine the inventive serving system with some conventional cooking. It would e.g. be possible to prepare a food dish comprising e.g. potatoes, vegetables and sauce at a specific food supplier and deliver it to a restaurant as described above. The restaurant may be provided with a grill in which fresh meat is grilled and thereafter combined
15 with the heated food dish.

A flow chart of a method for the serving of hot food dishes, where a food dish is a frozen, pre-cooked food dishes comprised in a food tray is shown in Fig. 2. In step 100, a service point is provided with a predetermined menu, where the menu comprises a plurality of different food dishes,
20 where each food dish is a frozen, pre-cooked food dish comprised in a food tray and stored in a freezer. The menu may be based on different categories, such that it may be an Italian menu, a Spanish menu, a vegetarian menu, etc.

In step 110, one of the pluralities of different food dishes from the menu is
25 selected by a customer. It is also possible that the food dishes are selected as a meal of the day, where e.g. two different food dishes are selected. Normally, a plurality of different dishes is selected by different customers at the same time.

In step 120, the selected food dish is heated in a predetermined manner in a heating oven. Several food dishes may be heated at the same time, or a single food dish may be heated separately.

5 In step 130, the food tray with the heated food dish is removed from the heating oven and is placed on a plate. It is also possible to heat the food dish on a plate, but it is more space efficient to heat the food dish without a plate.

10 In step 140, the bottom of the food tray is removed by pulling a tab, such that the food dish comes in contact with the plate without any handling of the food dish.

In step 150, the food tray is removed by lifting it upwards from the plate, such that the hot food dish is ready to be served to a customer. It is possible to add some fresh constituents, such as a salad or a cold sauce, at this stage.

15 In step 160, the hot food dish is served to a customer on the plate.

The invention is not to be regarded as being limited to the embodiments described above, a number of additional variants and modifications being possible within the scope of the subsequent patent claims. The serving system can be used for all types of food and can also be used for all kinds
20 of serving outlets.

REFERENCE SIGNS

- 1: System
 - 2: Food tray
 - 3: Freezer
 - 5 4: Heating oven
 - 5: Heating oven
 - 6: Plate
 - 7: Food dish
 - 8: Ordering system
- 10

CLAIMS

1. Method for serving a hot food dish at a service point, comprising the steps of:

- 5 - providing the service point with a predetermined menu, where the menu comprises a plurality of different food dishes, where each food dish is a frozen, pre-cooked food dish comprised in a food tray and stored in a freezer,
- 10 - selecting one of the plurality of different food dishes,
- heating the selected food dish in a predetermined manner in a heating oven, such that the cooking of the food dish is completed,
- 15 - removing the food tray with the heated food dish from the heating oven and placing it on a plate,
- removing the bottom of the food tray by pulling a tab, such that the food dish comes in contact with the plate without any handling of the food dish,
- removing the food tray by lifting it upwards from the plate,
- 20 - serving the hot food dish on the plate to a customer.

2. Method according to claim 1, characterized in that a plurality of food dishes are heated at the same time in a regeneration oven.

3. Method according to claim 1 or 2, characterized in that a plurality of different food dishes are heated at the same time in a regeneration oven.
4. Method according to any of claims 1 to 3, characterized in that an additional individual food dish is heated separately using microwaves.
5. Method according to any of the preceding claims, characterized in that the food tray is placed on a plate prior to the heating in a heating oven.
6. Method according to any of the preceding claims, characterized in that the food dishes are ordered from an intermediate supply storage in a full delivery unit, where the ratio between the different food dishes in an order depends on the actual amount of different food dishes stored at the service point.
7. Method according to claim 5, characterized in that an order is placed to the intermediate storage when the amount of one of the food dishes equals a predefined minimum amount.
8. Method according to any of the preceding claims, characterized in that a delivery unit is a standardized pallet.
9. Method according to any of the preceding claims, characterized in that a food dish is complemented with an additional cold constituent after the heating, such as a salad or a cold sauce.
10. Method according to any of the preceding claims, characterized in that the service point is a restaurant.

11. System for a service point (1), adapted for the serving of a hot food dish (7) on a plate (6), where the food dish is a frozen, pre-cooked food dish comprised in a food tray (2) and which is heated at the service point, where the service point comprises a freezer (3) for storing frozen food dishes and at least one heating oven (4, 5) for heating a food dish, characterized in that the heating oven is adapted to heat a food dish (7) in a food tray (2), that the food tray is adapted to be placed on a plate (6) before or after the heating, that the bottom of the food tray (2) is adapted to be removed from the food tray such that the food dish comes in contact with the plate without handling the food dish, such that the hot food dish (7) can be served to a customer without any handling of the food dish (7).
12. System according to claim 11, characterized in that the service point comprises an ordering system (8) that is adapted to order food dishes (7) from an intermediate storage to the service point (1).
13. System according to claim 12, characterized in that the ratio between different food dishes in an order is based on the actual distribution of different food dishes stored in the freezer of the service point.
14. System according to any of claims 12 or 13, characterized in that the amount of food dishes ordered corresponds to a full delivery unit.
15. System according to any of claim 12 to 14, characterized in that a delivery unit is a standardized pallet.

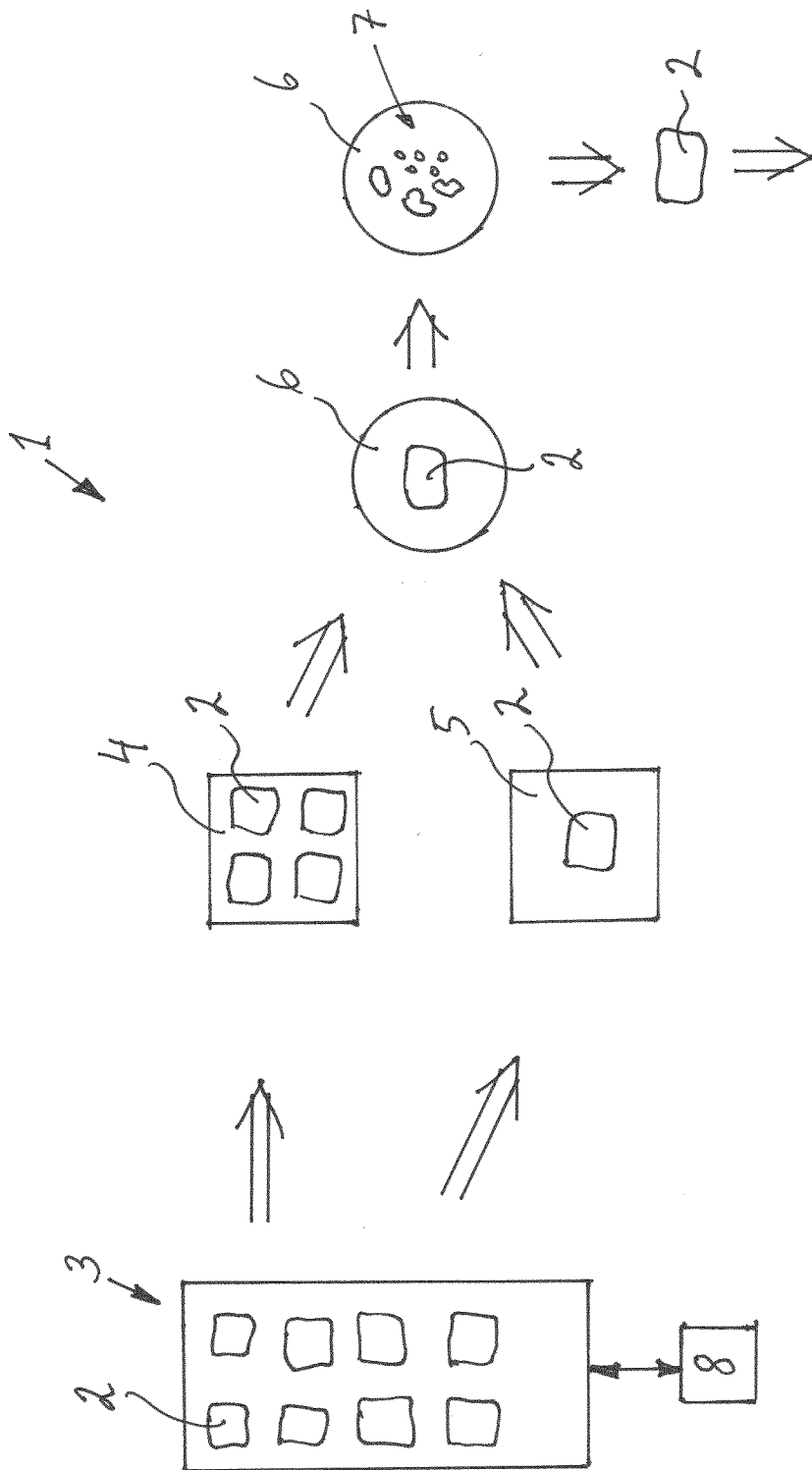


Fig. 1

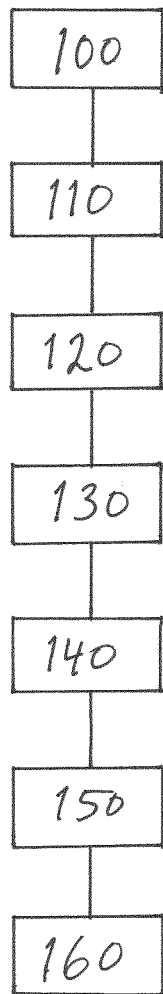


Fig. 2