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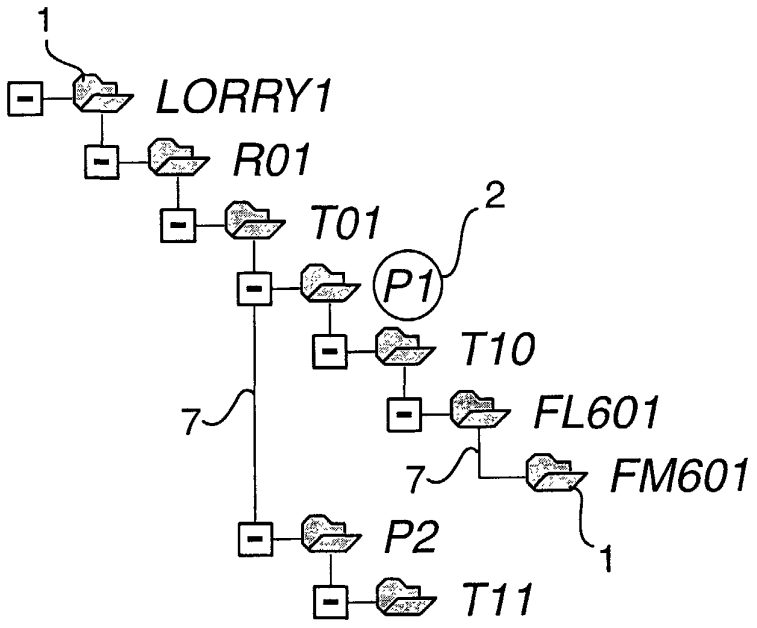
(54) Title: A METHOD OF TRACKING IN PRODUCTION IN A PLANT FOR LIQUID FOODS



(57) Abstract: The invention relates to a method of tracking in production in a plant for liquid foods. Each production unit (1) in the plant is allocated an identity (2) which is registered in a database. Each production unit (1) may consist of a source or a destination. Each material quantity (3) which is included in the production is allocated an identity (4) which is registered in the database. A material quantity (3) consists of a given product (5) of a given quantity (6). Each event (7) in the plant is allocated an identity which is similarly registered in the database, as a transport. The registration takes place as a transport from a source to a destination, with references to the material quantity identities (4) of both the source and the destination.

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A METHOD OF TRACKING IN PRODUCTION IN A PLANT FOR LIQUID FOODS

TECHNICAL FIELD

The present invention relates to a method of tracking in production in a plant for liquid foods.

BACKGROUND ART

In all types of plants which produce foods, there is a need for some form of tracking in production so that it is possible, from the finished product, to obtain information as to the raw materials which were included and from whence these raw materials came. In some cases, legislation is already in place or will soon be in place requiring such tracking capabilities.

In a number of food production plants, such as within the meat industry, there have long existed sophisticated systems making for such tracking in a simple manner. For example, meat may be marked with food-approved stamps which can be read-off both manually and by machine.

As regards plants for liquid foods, such as dairies and juice factories, it has not proved as easy to establish a system of tracking. One method which has been in place for some time is the method of employing time and date stamps. Each transport in, for example, a dairy is allocated a time and date stamp, a start and stop time, when the transport took place. By comparing different time and date stamps, it is possible to create a tree structure which provides for tracking. The drawback inherent in this system is that the method cannot be employed if a transport, for some reason, is delayed. Since delays occur more or less generally in most plants, this method is not entirely reliable.

A more recent method is the so-called batch identification method, where all units which are included in a process are allocated an identification which readily makes for tracking. This method is extensively used within the pharmaceuticals industry. The drawback is that the units which are reserved for a batch cannot be employed for anything else during the time when the batch is processed. Much greater flexibility is desirable within the dairy industry. For example, it is not uncommon to need to fill a tank, which then constitutes one batch, at the same time as the same is to be emptied, which then constitutes another batch.

OBJECTS OF THE INVENTION

One object of the present invention is to realise a method for attaining tracking in a plant for liquid foods which does not suffer from the problems and limitations of prior art methods.

A further object of the present invention is that the method must be capable of being processed simply in a database and that, with the aid of this database, it is possible rapidly and reliably to obtain information which tracks the raw materials in a dairy, in a juice factory or in the production of still drinks.

SOLUTION

These and other objects have been attained according to the present invention in that the method of the type described by way of introduction has been given the characterising features of allocating each production unit a unit identity constituting a source and/or a destination, and registering the unit identity in a database; allocating each material quantity of the product in the production a work identity, and registering the work identity in a database; and allocating each event in the plant an event identity, and registering the event identity in a database, wherien the event identity identifies transport of at least a portion of the material quantity from a source with reference to the work identity and/or unit identity of the source, and/or to a destination with reference to the work identity and/or unit identity of the destination; and displaying data associated with the event identity at a specific point in time based on the unit identity and/or the work identity.

Preferred embodiments of the method according to the present invention have further been given the characterising features as set forth in the appended subclaims.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

One preferred embodiment of the method according to the present invention will now be described in greater detail hereinbelow, with reference to the accompanying Drawings. In the accompanying Drawings:

Fig. 1 shows a first "tree structure", displaying events;

Fig. 2 shows a tracking report; and

Fig. 3 shows a second "tree structure" displaying events.

DESCRIPTION OF PREFERRED EMBODIMENT

The present invention consists of a method for tracking in production which is particularly applicable to plants for liquid foods such as dairies, juice factories or in the production of so-called still drinks. In a dairy or a juice factory, there is an amount of processing equipment which is interconnected via conduits. Each individual section of the

processing equipment is designated a production unit 1. A production unit 1 may, for example, consist of a tank, a pasteurizer, a filling machine or the like. A production unit 1 may also consist of a road tanker, an intake line or a filling line.

Each production unit 1 is allocated an identity 2 which is registered in a database. The identity 2 may be disclosed by means of figures or by letters, or by a combination of both. Figs. 1 and 3 show different unit identities 2 such as LORRY 1 which is a road tanker, T01 and T10 which are tanks, and so on. These identities 2 are more or less permanent for a plant but vary from one dairy or juice factory to another, depending on what equipment is in place in the plant.

During production in a plant for liquid foods, product or material is handled in different volumes. By identifying these as material quantities 3, they can be allocated an identity 4 which is registered in the database. A material quantity 3 is defined by a certain product 5, such as raw milk, pasteurized milk and so on, by a certain volume or quantity 6 which is indicated in litres or kilos. The identity 4 may also be given in figures or letters or as a combination of both. The number of characters depends on how long the intention is to run the plant before the unique identity 4 must be re-used. Fig. 2 shows material quantity identities 4 indicated under the column WorkID.

When a product is produced in a plant for liquid foods, in principle the different material volumes or quantities 3 are transported. The transport may encompass an entire material volume or quantity 3 or a part thereof. This may be defined as a number of events 7 which may also be described as constituting transports between the different production units 1. An event 7 has a source and a destination, where the source and the destination consist of different production units. The events 7 are registered in the database and are allocated a unique event identity. The events 7 are registered with references to the material quantity identity 4 of the source and material quantity identity 4 of the destination. The event identity 7 may be indicated by figures or letters or as a combination of both.

Before anything happens in the plant, the material 5 which is to be transported must be allocated a material quantity identity 4. An event identity must also be indicated. For example, the driver of a road tanker arriving at the dairy may not empty his road tanker before the contents of the road tanker have been allocated an identity 4 and that the emptying procedure which constitutes an event has been allocated its identity number. There must be clear and unambiguous rules as to how and when identities 4 are to be allocated. However, these rules may vary from one dairy to another. Examples of such rules are that the contents of a tank must be emptied or the tank be washed before a new material quantity identity 4 can

be allocated. For a pasteurizer, it is, for example, thus that material quantity identities 4 are indicated at production start-up per product 5.

With the method according to the present invention, it is a simple matter to create identities 2, 4 which can be communicated with the outside world and a possibility will then be created to track from whence the contents in a specific production unit 1 derive. The event sequence in a plant can be given in a "tree structure" which is shown in Fig. 1 or Fig. 3.

In Fig. 1, each production unit 1 is illustrated by a file on each occasion when the production unit 1 is employed in production. The production unit 1 may be both a source and a destination, depending on how the material quantities 4 have been transported. The transports, i.e. the events 7, are shown in Fig. 1 as thin lines between two files.

The example in Fig. 1 shows a "tree structure" where a road tanker LORRY 1 enters a dairy. The road tanker LORRY 1 empties its tank, the contents consisting of raw milk, via a reception line R01 to a tank T01. From the tank T01 which contains a certain quantity of raw milk, a part of this quantity of raw milk is conducted further to a pasteurizer P1. After the pasteurizer, the material, which now consists of pasteurized milk, is fed to a tank T10. The remaining part of the material quantity in the tank T01 is conveyed to another pasteurizer P2 and from this further to a tank T11.

The material quantity which is in the tank T10 and which consists of pasteurized milk of a certain quantity is transported according to Fig. 1 further to a filling line FL601 and to a filling machine FM601 where the pasteurized milk is packed in consumer packages.

All material quantities 3 with their identities 4 which are handled in the plant, and all events 7 with their identities are registered in a specifically adapted database. For each event 7, a source and destination are indicated with their respective unit identities 2 and with references to the material quantity identity 4 of the source and the destination, respectively. This data may be presented in the form of a "tree structure" as shown in Fig. 1 and Fig. 3, or in a Track Report as shown in Fig. 2.

The Track Report (Fig. 2) is designed as an answer to a question. In the example, the tank T01 has been taken as the point of departure. The report is divided in two and the first part provides information about from whence the contents of the tank T01 derive. In the second part, information is provided as to where this content was subsequently transported. In the one case, the tank T01 has thus been the destination and in the second case it has been the source.

In each respective part of the report, there are columns for WorkID, i.e. the material quantity identity 4 and the source and destination, respectively, which are indicated as a unit

identity 2. There may also be provided columns in the report for the time interval during which the transport/event 7 was carried out or occurred, which product 5 was transported and in what quantity 6, as well as who initiated the event 7.

Fig. 3, which also consists of a so-called "tree structure", shows the advantages of the method in relation to a time axis 8 which is illustrated by a broken line. Since it is common, for example, in a dairy to use a started pasteurizer P1 for a number of different products 5 without intervening cleaning of the pasteurizer, it is possible to track a certain material in different parts of the "tree structure". This is possible in that the material quantity 3 which passes through the pasteurizer P1 is given different material quantity identities 4 depending on product 5 and the quantity 6 of each product 5.

By also indicating cleaning of the pasteurizer 9 with a material quantity identity 4 (WorkID) it is simple and reliable to determine where the material quantity identities 4 of different products 5 have points of contact with one another and where they do not. That material quantity identity 4 which constitutes the washing, CIP (Cleaning in Place), has no source and no destination.

With the aid of these methods of presenting the product flow and the event sequence in a plant for liquid foods, it is possible, in a rapid and reliable manner, to track the contents of a product at any point whatever in the plant, both from whence the product comes and to where it has been transported.

As will have been apparent from the foregoing disclosure, the present invention realises a method for tracking within a dairy or a juice factory which does not display the problems and limitations of prior art methods.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of tracking a product in production in a plant for liquid foods, including the following steps:

allocating each production unit a unit identity constituting a source and/or a destination, and registering the unit identity in a database;

allocating each material quantity of the product in the production a work identity, and registering the work identity in a database; and

allocating each event in the plant an event identity, and registering the event identity in a database, wherien the event identity identifies transport of at least a portion of the material quantity from a source with reference to the work identity and/or unit identity of the source, and/or to a destination with reference to the work identity and/or unit identity of the destination; and

displaying data associated with the event identity at a specific point in time based on the unit identity and/or the work identity.

2. The method as claimed claim 1, characterised in that each material quantity is determined by a certain product, by a certain volume or quantity.

3. The method as claimed in any one of the preceding claims, characterised in that each unit identity and work identity consists of a number of figures or letters or of a combination of figures and letters.

4. The method as claimed in any one of the preceding claims, characterised in that a material quantity may only change work identity preceded by an event.

5. The method as claimed in any one of the preceding claims, characterised in that the events and the material flow in a plant may be illustrated in a"tree structure".

6. The method as claimed in any of the preceding claims, characterised in that a work identity may consist of a washing of a production unit, said work identity having no source and no destination.

7. A method of tracking in production in a plant for liquid foods substantially as herein described with reference to any one of the embodiments illustrated in the accompanying figures.

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WATERMARK PATENT & TRADE MARK ATTORNEYS

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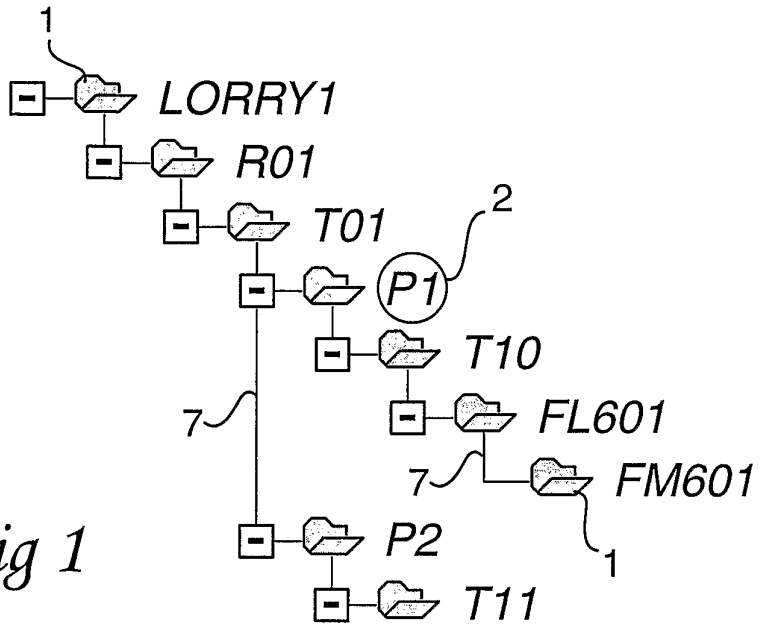

Fig 1

Track Report

Printed: *2002-04-14*

Work ID: *1871232222*

Material Input to T01

Work ID	Source	Between	Material	Actual	StartedBy
561 234 567	*R01*	*2002-03-25 06:21:(6:42:00*	*Raw milk*	*19 765,00*	*Barry*
561 234 568	*R01*	*2002-03-25 07:32:(7:59:00*	*Raw milk*	*22 156,00*	*Barry*

Material Output from T01

Work ID	Dest.	Between	Material	Actual	StartedBy
112 314 433	*P1*	*2002-03-25 09:30:(10:12:00*	*Raw milk*	*19 802,00*	*Barry*
994 399 912	*P2*	*2002-03-25 10:14:(11:02:00*	*Past. milk*	*21 102,00*	*Barry*

Fig 2

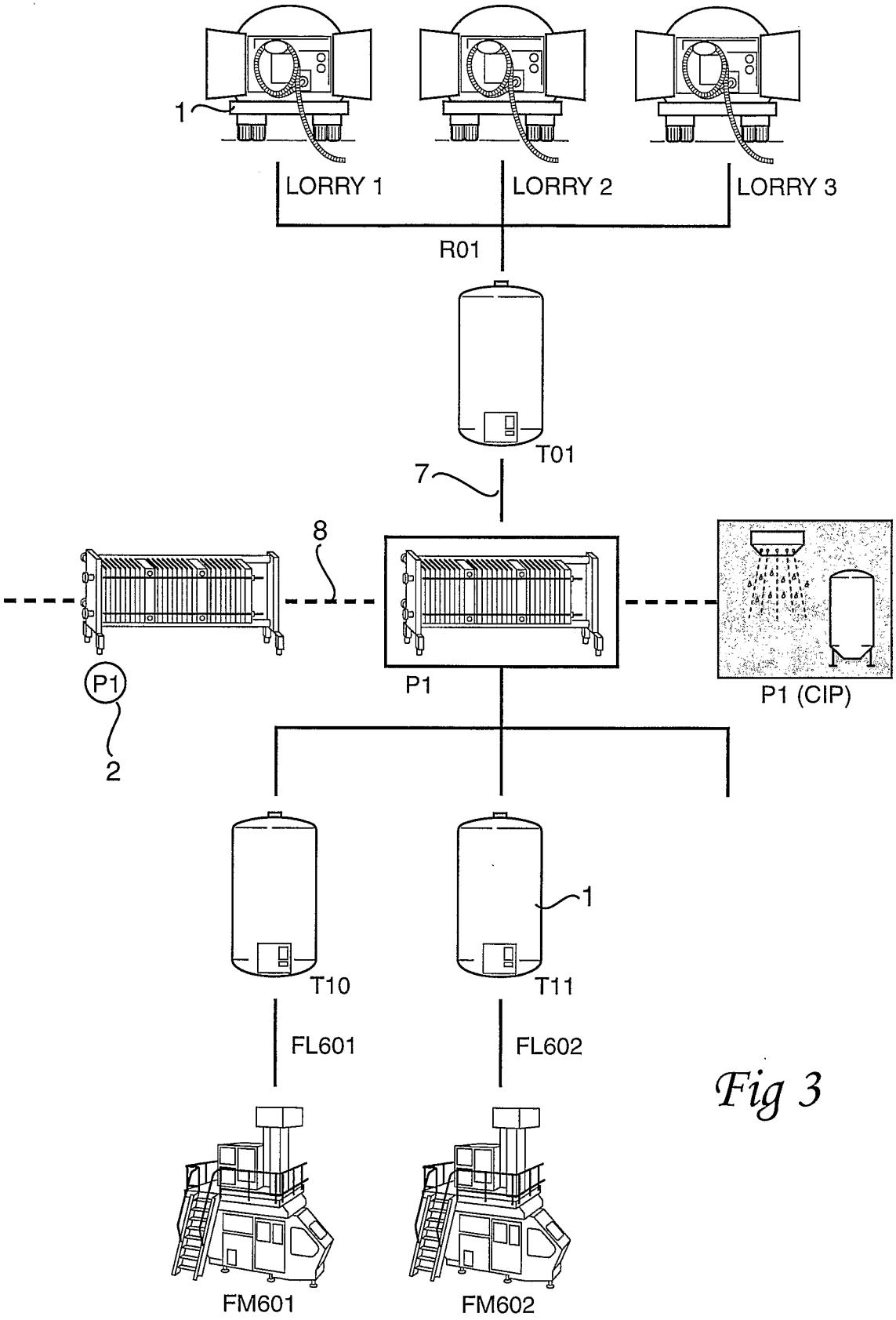
1
LORRY 1
LORRY 2
LORRY 3
R01
T01
7
8
P1
2
P1
P1 (CIP)
T10
T11
1
FL601
FL602
FM601
FM602

Fig 3