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(54) Title: ARRANGEMENTS AND METHOD IN A MILKING SYSTEM

(57) Abstract: An arrangement is provided in a milking system for simultaneous milking of animals comprising milking positions (P1-P24), each of which being provided with teat cups, which are attached to the teats of an animal and are connected to a source of vacuum to milk the animal. The arrangement comprises a processing device (10) for gathering and processing information of the milking of the animals, and terminal units (13) arranged at the milking positions and connected to the processing device (10). The processing device is provided for (i) receiving a user identity; (ii) retrieving a user specific setting based on the received user identity, said user specific setting defining user specific information of the milking of the animals; and (iii) transmitting information of the milking of the animals to the terminal units defined by the retrieved user specific setting. The terminal units output automatically the information received from the processing device.

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Arrangements and method in a milking system

TECHNICAL FIELD OF THE INVENTION

The present invention generally relates to the field of dairy farming and more specifically the invention relates to arrangements and methods according to the preambles of the appended independent claims.

DESCRIPTION OF RELATED ART

Milking systems for simultaneously milking a plurality of milking animals are known in the art. Such milking systems comprise a plurality of milking positions, wherein each of the milking positions is provided with teat cups, which are attached to the teats of a milking animal and connected to a source of vacuum to milk the milking animal. Typically, an arrangement is provided for establishing identities of, and expected milking times for, the milking animals present at the milking positions. The milking systems may e.g. be of Herringbone or parallel stall type.

In one such milking system the milking animals are allowed to enter the milking positions in a group and are identified. Then, a dairy farmer walks from milking position to milking position and attaches teat cups manually to the teats of the milking animals present at the milking positions in a consecutive order. Milking is started at a milking position when the teat cups have been attached to the milking animal present at the milking position. The milking animals are allowed to leave the milking positions in a group when all milking animals have been milked.

In such milking system there may be provided terminal units connected to an information gathering and control device of the

milking system. The terminal units may display information of different actions to be taken, they may provide monitoring and status information of the progress of the milking, and they may give alarms of different kinds. Further, the terminal units may be used for initiating some actions and for correcting erroneous information. In a modern milking system there are obviously a large number of actions to be taken, tasks to be performed, and processes to be monitored by the dairy farmer.

SUMMARY OF THE INVENTION

A problem of the prior art milking system, wherein the farmer is provided with information of different actions to be performed, with monitoring and status information, and with alarms of different kinds, a problem may arise as the farmer is easily overwhelmed with information of different kinds. Sometimes it will be so much information present that the farmer will not be capable of giving priorities to actions that have to be performed and processes that have to be monitored.

It is an object of the invention to address and solve the above identified problem.

Arrangements and methods as claimed in the appended patent claims are provided to attain the above object.

According to aspects of the invention there are provided three arrangements in a milking system for simultaneous milking of a plurality of milking animals, wherein the milking system comprises a plurality of milking positions. Each of the milking positions is provided with teat cups, which are attached to the teats of a milking animal and are connected to a source of vacuum to milk the milking animal.

The first one of these three arrangements comprises a processing device for gathering and processing information of the milking of the milking animals, and terminal units arranged at the milking positions and connected to the processing device.

The processing device comprises (i) means for receiving a user identity; (ii) means for retrieving a user specific setting based on the received user identity, wherein the user specific setting defines user specific information and/or instructions regarding the milking of the milking animals; and (iii) means for transmitting the information and/or instructions regarding the milking of the milking animals to the terminal units defined by the retrieved user specific setting.

The terminal units are provided for automatically outputting the information and/or instructions regarding the milking of the milking animals as received from the processing device.

An automatic arrangement is thereby provided, by which user specific settings for the terminal units can automatically be loaded when the dairy farmer or other operator identifies him/herself for the milking system. By automatically loading the user specific settings the operator may easily find the information or instructions he/she wants, needs, requires, or is requested to, by a quick glimpse at the terminal devices. The operator could not only obtain the information and/or instructions he/she needs by looking at the terminals, but could also obtain the information and/or instructions in the form, e.g. graphical or alphanumerical, he/she wants to.

The second one of the above three arrangements is implemented in a milking system comprising a vertically adjustable floor, on which an operator of the milking system may stand while

attaching the teat cups to the teats of the milking animals. The arrangement comprises a processing device for controlling the vertical position of the vertically adjustable floor. The processing device includes (i) means for receiving a user identity; (ii) means for retrieving a user specific setting based on the received user identity, wherein the user specific setting defines a user specific vertical position of the vertically adjustable floor; and (iii) means for controlling the vertical position of the vertically adjustable floor in response to the retrieved user specific setting. Thereby the operator is liberated from such a simple operation as adjusting the floor, and can thus concentrate on other issues of greater importance.

The third one of the above three arrangements comprises for each of the milking positions, a terminal unit of a first kind arranged at the milking position, connected to a processing device, and provided for displaying information of a first kind of the milking position. A portable terminal unit is wirelessly connected to the processing device and comprises a position indicator device for indicating a position of the portable terminal unit. Means are provided for automatically finding a group of several adjacent ones of the milking positions that are in proximity of the portable terminal unit based on the indicated position of the portable terminal unit. The portable terminal unit further comprises means for automatically displaying information of a second kind of the group of several adjacent ones of the milking positions.

The portable terminal unit should preferably be arranged in a holder mountable at the chest of the operator so that the operator can see the display more or less continuously while having his/her hands free for performing various activities.

An automatic arrangement is thereby provided, by which the terminal devices of the second kind are replaced by a portable terminal device, which has a display that is automatically updated so that, at each instant, information of the second kind of a group of neighboring milking positions located in proximity to the portable terminal device, is displayed.

The operator does not need to walk by each of a number of fixedly located terminals of a second kind, but can just look at the display of the portable terminal device to obtain information of the second kind. The operator does not need to press any buttons or the like in order to obtain this information, but can again concentrate on more important issues.

According to further aspects of the invention there are provided methods for using the arrangements as identified above.

According to a yet further aspect of the invention there is provided an arrangement in a milking system for simultaneous milking of a plurality of milking animals, wherein the milking system comprises a plurality of milking positions and an arrangement for establishing identities of the milking animals. Each of the milking positions is provided with teat cups, which are attached to the teats of a milking animal and are connected to a source of vacuum to milk the milking animal. The arrangement in the milking system comprises a processing device for gathering and processing information of the milking of the milking animals. For each of the milking positions, a terminal unit of a first kind is arranged at the milking position and connected to the processing device; and for each group of several adjacent ones of the milking positions, a terminal unit of a second kind is arranged at the group of several adjacent ones of the milking positions and connected to the processing device.

The processing device comprises (i) means for automatically establishing, for each of the milking animals, a phase of the milking of the milking animal; (ii) means for automatically selecting, for each of the terminal units of the first and/or second kind, portions of the information of the milking of the milking animals to be displayed by the terminal unit based on the established phases of the milking of the milking animals; and (iii) means for automatically transmitting, for each of the terminal units of the first and/or second kind, the selected portions of the information of the milking of the milking animals to the terminal unit.

Finally, each of the terminal units of the first and/or second kind is provided for automatically outputting the selected portions of the information of the milking of the milking animals as received from the processing device.

In one embodiment the means for automatically selecting is provided for selecting, for each of the terminal units of the second kind, different portions of the information of the milking of the milking animals to be displayed by the terminal unit of the second kind during different phases of the milking of the milking animals.

Such milking phases may include an identification phase, a teat cup attachment phase, a stimulation phase, a milking phase, and a post-milking phase.

The different portions of the information may include information of verified, unverified, and missing identities of milking animals, information of reminders supporting an operator before milking of milking animals, information of milk flow and/or yield of milking animals, and information of termination of milking.

Hereby an automatic arrangement is provided, by which an automatic selection of information can be made, and only a selected portion of the information is communicated to the operator, via the terminal devices of the second kind, during each phase of the milking. By communicating the selected portion only, the operator may easily find the information he/she wants by a quick glimpse at the terminal devices of the second kind.

According to a still further aspect of the invention there is provided a method for using the arrangement as identified above.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic top view of a parallel stall milking system including an arrangement according to an embodiment of the present invention.

Fig. 2 is a schematic perspective view of part of the milking system of Fig. 1.

Fig. 3 is a schematic view of a terminal unit of a first kind as being included in the inventive arrangement of Fig. 1.

Figs. 4-7 are schematic views of a terminal unit of a second kind in different modes as being included in the inventive arrangement of Fig. 1.

In the detailed description the milk producing animals are referred to as cows. However, the invention is not limited to cows, but is applicable to any animals having the capability to produce large quantities of milk, such as sheep, goats, buffaloes, horses, etc.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Fig. 1 shows a schematic top view of a parallel stall milking system including an arrangement according to an embodiment of the present invention. The parallel milking stall system may be exchanged for any other kind of milking system wherein a plurality of cows are milked simultaneously such as for example a Herringbone type of milking system. The parallel milking stall system comprises a plurality of milking positions, in the illustrated case 24 milking positions P1-P24. In such a milking system cows enter into, are milked in, and leave, the respective milking positions in groups.

The milking system comprises an arrangement for establishing identities of the cows (not explicitly illustrated), which forward the established identities to a computer-based processing and control device 10, which is responsible for processing and controlling of the milking system. The processing and control device 10 comprises typically a microcomputer, suitable software, and a database including information of each of the cows milked by the milking robot, such as e.g. when the respective cow was milked last time, when the cow was fed last time, the milk production of the cow, the health of the cow, the expected milking time of the cow, etc.

Each of the milking positions P1-P24 comprises teat cups that are attached to the teats of a cow and are connected to a source of vacuum to milk the cow (none of which being explicitly illustrated) as being common in the field.

Further, the milking system comprises, for each of the milking positions P1-P24, a terminal unit 11 of a first kind arranged at the milking position P1-P24, connected to the processing and control device 10, and provided for displaying information of a first kind of the milking position to a dairy farmer or other operator 15. For each group P1-P4; P5-P8, ... of adjacent

milking positions P1-P24, a terminal unit 13 of a second kind is arranged at the group of adjacent milking positions, connected to the information processing and control device 10, and provided for displaying information of a second, preferably more detailed, kind of the group of adjacent milking positions P1-P24 to the operator 15. The group may consist of other number of milking positions than four, such as e.g. 3-7 milking positions.

The information of the first kind may i.a. comprise information of (i) when further information is obtainable from the terminal units 13 of the second kind, (ii) when the milking position is closed for milking, (iii) when the milk milked at the milking position is diverted, (iv) when the milking position is being cleaned, (v) when vacuum is applied, and (vi) when a milk flow is present. The information of the second kind may i.a. comprise information of (i) verified, unverified, and missing identities of cows present at milking positions, (ii) various reminders supporting the operator during different phases of the milking, (iii) milk flows and/or yields during milking, (iv) expected remaining milking times, (v) termination of milking of the cows, and (vi) milk yields obtained for the cows.

The terminal units 11, 13 may also be used as input devices for altering information and/or for controlling different processes with respect to the milking. For instance, the terminal units 11 of the first kind may be used for turning on and off vacuum to the teat cups of the respective milking positions, whereas the terminal units 13 of the second kind may be used for controlling the feeding of the cows present at the respective milking positions, for controlling automatic gates of the milking system, for controlling a robot arm, for switching the

respective milking positions between milking and cleaning modes, and for controlling the cleaning of the milking equipment.

Further, a portable device 17 including outputting means, such as e.g. loudspeaker, earphone, or earpiece device, to be held or worn by the operator 15 of the milking system is provided. The portable device comprises a receiver for receiving information wirelessly from the processing and control device 10, and for communicating such information verbally to the operator 15. To this end, the processing and control device 10 comprises a transmitter for transmitting information wirelessly.

The portable device 17 may alternatively or additionally include outputting means for visual output.

In Fig. 2, a schematic perspective view of part of the milking system of Fig. 1 is shown. A vertically adjustable floor 19 is provided, on which the operator 15 of the milking system may stand while performing various actions including the attachment of the teat cups to the teats of the cows present at the milking positions P1-P24.

The processing and control device 10 may be provided for determining a milking position, at which the cow having the longest expected milking time is present, based on established identities and expected milking times for the cows present at the milking positions P1-P24.

The terminal devices 11 of the first kind are provided for outputting to the operator 15 prior to the teat cups are attached to the teats of the cows present at the milking positions P1-P24 indications of the milking position at which the cow having the longest expected milking time is present, to thereby allow for the operator 15 to have the teat cups attached

to, and to start milking, the cow having the longest expected milking time first.

The processing and control device 10 may be provided for determining *several* milking positions, at which the cows having the longest expected milking times are present, based on established identities and expected milking times for the cows.

The number of milking positions may be dependent on the distribution of expected milking times among the cows present at the milking positions P1-P24. For instance, if there are a large number of cows present at the milking positions P1-P24 having very long expected milking time, the number of milking positions may be set to this large number. If there is a single cow having much longer expected milking time than the other cows, the number of milking positions may be set to one.

The number may also be dependent on the locations of the milking positions, at which the cows having the longest expected milking times are present. If a cow having a rather long expected milking time stands in a milking position adjacent a milking position housing a cow with very long expected milking time, both milking positions may be considered by the processing and control device 10 as belonging to the *several* milking positions.

If the milking system is provided with a robot 20a movable along e.g. a rail 20b and provided for automatically attaching teat cups to the teats of the cows present at the milking positions P1-P24, the above outputting may be exchanged for an automatic teat cup attachment procedure, wherein the robot 20a is provided for automatically attaching teat cups to the teats of the cow having longest expected milking time first.

In a generalized version, means are provided for performing an action with respect to the milking system in response to the determination of the milking position, at which the cow having the longest expected milking time is present.

In an alternative embodiment the processing and control device 10 is provided for calculating an order, in which the cows present at the milking positions should have teat cups attached to their teats, based on the established identities and expected milking times. Such calculated order is communicated to the operator 15 or the robot 20a is provided for attaching teat cups to the teats of the cows in such calculated order.

In Fig. 3, a schematic view of a terminal unit of a first kind is shown. Various status symbols are shown at 31, whereas an illuminated button is shown at 32.

Preferably, each of the terminal devices 11 of the first kind comprises means for indicating visually, such as e.g. by means of a fixed or blinking light, whether the cow present at the milking position, at which the output device is located, belongs to the cow(s) having the longest expected milking time(s).

Alternatively, instead of having the terminal units 11 of the first kind to indicate at which milking positions cows should have teat cups attached to their teats first, the portable device 17 may be provided to communicate this information verbally to the operator.

In order to further reduce the time the cows stay at the milking positions, various activities may be performed automatically and very early in the milking process, i.e. before the operator 15 enters the milking system. Examples of such activities include to start the vacuum pump used as a vacuum source, to perform

pre-rinsing of the milking system, to perform various activities with respect to cleaning, to have the cows entered into the milking positions or at least into a gathering area, to switch valve(s) to obtain milking vacuum, and to move the teat cups into a position close to where the teats of the cows are or will be located.

If cows kick off teat cups or teat cups are not appropriately attached during the attachment of the teat cups, there may arise a situation where cows, which have not been milked out or have not been milked at all, are allowed to leave the milking system. To remedy such problem, the terminal units 11 of the first kind may have visual alarms, e.g. a red blinking light, or sound alarms to draw the attention of the operator in cases where a cow has not been milked correctly. Such circumstance may be discovered by comparing the actual milk yield with an expected milk yield. Alternatively, or additionally, the gates of the milking system may be controlled so that cows that are not milked (or all cows in the milking system) are not allowed to leave the milking system until these unmilked cows have been milked or until at least the operator is notified and has taken some action.

The processing and control device 10 connected to the milking system may be provided or supplied with instructions on actions to be taken with regard to the milking of the cows by the milking system, wherein the processing and control comprises processing means for automatically processing the instructions and for automatically selecting a subset of the instructions, and transmitting means for automatically transmitting the subset of the instructions wirelessly. The receiver of the portable device 17 is in turn provided for receiving the transmitted subset of the instructions wirelessly and the outputting means

the portable device 17 is provided for outputting the subset of the instructions, preferably verbally, to the operator. Hence, the operator may receive selected instructions only, e.g. instructions of greater importance.

Preferably, each of the actions to be taken by the operator has a priority, and the processing and control device 10 is provided for automatically processing the instructions and for automatically selecting the subset of the instructions based on the priorities of the actions.

Alternatively or additionally, each of the actions to be taken by the operator has a degree of complexity, and the processing means is provided for automatically processing the instructions and for automatically selecting the subset of the instructions based on the degrees of complexity of the actions.

Further, the instructions may comprise identifications of the milking positions, at which the corresponding actions are to be taken.

The instructions may e.g. include:

(i) instructions on attachment and/or detachment of teat cups at identified milking positions;

(ii) instructions on connection of teat cups to vacuum and/or disconnection of teat cups from vacuum; and

(iii) instructions on checking of cows due to abnormal progress of the milking.

The processing and control device 10 may be responsible for gathering and processing information of the milking of the cows. Further, a module 10a of the processing and control device 10 is provided for automatically establishing, for each

of the cows, a phase of the milking of the cow. Another module 10b is provided for automatically selecting, for each of the terminal units of the first 11 and/or second 13 kind, portions of the information of the milking of the cows to be displayed by the terminal unit 11, 13 based on the established phases of the milking of the cows. A yet another module 10c is provided for automatically transmitting, for each of the terminal units of the first 11 and/or second 13 kind, the selected portions of the information of the milking of the cows to the terminal unit 11, 13.

Finally, each of the terminal units of the first 11 and/or second 13 kind is provided for automatically outputting the selected portions of the information of the milking of the cows as received from the transmitting module 10c of the processing and control device 10.

Advantageously, the selection module 10b is provided for selecting, for each of the terminal units 13 of the second kind, different portions of the information of the milking of the cows to be displayed by the terminal unit 13 of the second kind during different phases of the milking of the cows.

The different phases may comprise an identification phase, a teat cup attachment phase, a stimulation phase, a milking phase, and a post-milking phase.

Alternatively or additionally, the different portions of the information of the milking of the cows to be displayed by the terminal unit 13 of the second kind during different phases of the milking of the cows may be communicated to the operator 15 via the portable terminal unit 17. To this end, the portable terminal unit comprises a position indicator device for indicating a position of the portable terminal unit 17, and

means for automatically finding a group P1-P4, P5-P8, ... of several adjacent ones of the milking positions that are in immediate proximity of the portable terminal unit 17 based on the indicated position of the portable terminal unit 17. Further, the portable terminal unit 17 comprises means for automatically displaying the different portions of the information of the milking of cows present at the group P1-P4, P5-P8, ... of several adjacent ones of the milking positions that are in immediate proximity of the portable terminal unit 17.

Figs. 4-7 are schematic views of the terminal unit 13 of the second kind during the above different phases of the milking. The display of the terminal unit 13 of the second kind has in the identification and stimulation phases four different fields: a general information field 41, a cow number field 42, a reminder field 43, and a soft key field 44. In the milking and post-milking phases the display has a fifth field: milking data field 60. Each of the fields except the general information field 41 has separate sub-fields for each of the milking positions P1, P2, P3, P4 of the group of milking positions P1-P4.

The general field 41 may provide information such as date and time in all phases.

The cow number field 42 identifies the cow present at the milking position. In the identification phase information of verified, unverified, and missing identities of cows are found. Verified cows are shown by fixedly indicated number (i.e. 181920 and 21670), unverified cows are shown by blinking number (i.e. 2560 and 234), and missing identities are shown by blinking dashed lines (i.e. ------). If not all identities have been verified, the operator 15 verifies the missing identities

manually before next phase is entered. In all other phases this field shows cow identities.

The reminder field 43 shows by symbols various reminders supporting the operator 15 during the different phases. An example of different reminders with reference to the indicated reference numerals in Figs. 4-7 are listed below.

45 the group to which the cow belongs
47 the cow should not be milked
48 the milk from the cow is to be diverted
49 only some of the udder quarters should be milked
50 the cow should be treated
51 cow specific information, e.g. information regarding the teat cup kick-off tendency of the cow
52 the cow should be screened out
74 the cow has low milk yield

The milking data field 60 may in the milking phase give updated information on the milk yield during milking, both graphically 61 compared to an expected milk yield, and by figure 62. In the post-milking phase, the field may additionally indicate that the milking of the cow present at the milking position in question has been terminated by an underscored 73 milk yield figure.

During milking, instead of indicating the milk yield and expected milk yield, the milk flow and expected maximum milk flow may be indicated. Still alternatively, the milking time and expected milking time may be indicated. Yet alternatively, any combination of the above may be indicated.

The soft key field 44 provides an identification of the milking position in question. By touching this identification, the

display is shifted to another mode showing detailed information regarding the milking and other activities at this milking position only.

The processing and control device 10 may be provided for gathering and processing information of the milking of the cows. Further, a module 10d of the processing and control device 10 is provided for receiving a user identity from the operator 15.

Another module 10e of the processing and control device 10 is provided for retrieving a user specific setting based on the received user identity. The user specific setting defines user specific information, instructions, operations and/or alarms regarding the milking of the cows, regarding the handling of the milking animals, or regarding the milking system. Additionally, the user specific setting may define a user specific manner of communicating and/or displaying information of the milking of the cows.

The transmitting module 10c of the processing and control device 10 is provided for transmitting the information, instructions, operations and/or alarms regarding the milking of the cows, regarding the handling of the milking animals, or regarding the milking system to the terminal units of the first 11 and/or second 13 kind as defined by the retrieved user specific setting. Finally, the terminal units of the first 11 and/or second 13 kind are provided for automatically outputting the information, instructions, operations and/or alarms regarding the milking of the cows, regarding the handling of the milking animals, or regarding the milking system as received from the transmitting module 10c of the processing and control device 10.

An automatic arrangement is thereby provided, by which user specific settings for the terminal devices can automatically be loaded when the operator, identifies him/herself for the milking system. By automatically loading the user specific settings the operator may easily receive the information and/or instructions he/she wants, needs, requires, or is requested to, by a quick glimpse at the terminal devices. The operator should not only obtain the information he/she needs by looking at the terminals, but should also obtain the information in the form, e.g. graphical or alphanumerical, he/she wants to. The visual communication could be accompanied by oral or other messages.

The arrangement may be used to display information or instructions based on the operator's personal preferences or based on the operator's knowledge and skills. The operation of the milking system may be logged together with the identity of the operator and these data could be correlated to automatically determine the experience and knowledge of each of the operators of the milking system. As a final point, the information and/or instructions given to the operator during milking can be automatically determined based on the determination of the experience and knowledge of the operator identified prior to the milking.

Further, information and/or instructions can be manually determined by a dairy farmer, manager, supervisor, or the like, depending on the user identity. The manager may send user specific information and/or instructions at particular points of time depending on the experience and knowledge of the operator identified prior to the milking.

A variation of the concept of user settings comprises the module 10d of the processing and control device 10 for receiving a user identity from the operator 15. The module 10e

of the processing and control device 10 retrieves a user specific setting based on the received user identity. Here, the user specific setting defines a user specific vertical position of the vertically adjustable floor 19. A control module 10f is provided for controlling the vertical position of the vertically adjustable floor 19 in response to the retrieved user specific setting. Thereby the operator is liberated from such a simple operation as adjusting the floor, and can thus concentrate on other issues of greater importance.

Other parameters regarding the milking system and/or the environment in which the operator is present, such as for instance lighting parameters, can be automatically altered or adjusted depending on a received user identity and a specific setting for that operator.

While the invention has been described with reference to particular embodiments thereof it shall not be restricted to such embodiments. The scope of the invention is set by the appended patent claims.

CLAIMS

1. An arrangement in a milking system for simultaneous milking of a plurality of milking animals, said milking system comprising a plurality of milking positions (P1-P24), wherein each of the milking positions is provided with teat cups, which are attached to the teats of a milking animal and are connected to a source of vacuum to milk the milking animal, characterized in:

- a processing device (10) for gathering and processing information of the milking of said milking animals;

- terminal units (13) arranged at the milking positions and connected to said processing device (10), wherein

- said processing device (10) comprises

  - means provided for receiving a user identity;

  - means provided for retrieving a user specific setting based on the received user identity, said user specific setting defining user specific information regarding the milking of the milking animals; and

  - means provided for transmitting the user specific information regarding the milking of the milking animals as defined by the retrieved user specific setting to the terminal units; and

- the terminal units are provided for automatically outputting the user specific information regarding the milking of said milking animals as received from said processing device.

2. The arrangement of claim 1 wherein the user specific information comprises instructions.

3. The arrangement of claim 1 o 2 wherein

- the user specific setting defines a user specific manner of communicating and/or displaying information of the milking of the milking animals;

- the transmitting means is provided for transmitting the user specific manner of communicating and/or displaying information of the milking of the milking animals as defined by the retrieved user specific setting to the terminal units; and

- the terminal units are provided for automatically communicating and/or displaying the user specific information regarding the milking of the milking animals according to the user specific manner as received from said processing device.

4. The arrangement of claim 1 or 2 wherein

- the user specific setting defines user specific alarms regarding the milking of the milking animals.

- the transmitting means is provided for transmitting the user specific alarms as defined by the user specific setting to the terminal units; and

- the terminal units are provided for outputting the user specific alarms according to the user specific manner as received from said processing device.

5. The arrangement of any of claims 1-4 wherein the user specific information comprises user specific information, operations, or instructions regarding the handling of the milking animals or regarding the milking system.

6. The arrangement of any of claims 1-5 wherein

- the user specific setting defines a user specific vertical position of a vertically adjustable floor (19), on which an operator (15) of the milking system may stand while attaching the teat cups to the teats of the milking animals; and

- said processing device (10) comprises means provided for controlling the vertical position of the vertically adjustable floor (19) in response to the retrieved user specific setting.

7. The arrangement of any of claims 1-6 wherein

- said terminal units (13) arranged at the milking positions are provided for displaying information of a first kind of the milking positions;

- a portable terminal unit (17) wirelessly connected to said processing device (10) and comprising a position indicator device provided for indicating a position of said portable terminal unit; and

- means provided for automatically finding a group (P1-P4, P5-P8, ...) of several adjacent ones of the milking positions that are in proximity of said portable terminal unit based on said indicated position of said portable terminal unit, wherein

- said portable terminal unit (17) comprises means provided for automatically displaying information of a second kind of the group of several adjacent ones of the milking positions.

8. A method in a milking system for simultaneous milking of a plurality of milking animals, said milking system comprising a plurality of milking positions (P1-P24), wherein each of the milking positions is provided with teat cups, which are attached to the teats of a milking animal and are connected to

a source of vacuum to milk the milking animal, said method being characterized by the steps of:

- gathering and processing information of the milking of said milking animals;

- receiving a user identity;

- retrieving a user specific setting based on the received user identity, said user specific setting defining user specific information and/or instructions regarding the milking of the milking animals; and

- transmitting to terminal units the information and/or instructions regarding the milking of the milking animals as defined by the retrieved user specific setting; and

- automatically outputting, by the terminal units, the information and/or instructions regarding the milking of the milking animals as defined by the retrieved user specific setting.

9. An arrangement in a milking system for simultaneous milking of a plurality of milking animals, said milking system comprising (i) a plurality of milking positions (P1-P24) provided with teat cups; and (ii) a vertically adjustable floor (19), on which an operator (15) of the milking system may stand while attaching the teat cups to the teats of the milking animals, characterized in:

- a processing device (10) provided for controlling the vertical position of said vertically adjustable floor (19), said processing device (10) comprising

- means provided for receiving a user identity;

- means provided for retrieving a user specific setting based on the received user identity, said user specific setting defining a user specific vertical position of said vertically adjustable floor (19); and

- means provided for controlling the vertical position of said vertically adjustable floor (19) in response to said retrieved user specific setting.

10. An arrangement in a milking system for simultaneous milking of a plurality of milking animals, said milking system comprising a plurality of milking positions (P1-P24) and an arrangement provided for establishing identities of said milking animals, wherein each of the milking positions is provided with teat cups, which are attached to the teats of a milking animal and are connected to a source of vacuum to milk the milking animal, characterized in:

- a processing device (10) for gathering and processing information of the milking of said milking animals;

- for each of the milking positions, a terminal unit (11) of a first kind arranged at the milking position (P1-P24) and connected to said processing device (10); and

- for each group (P1-P4, P5-P8, ...) of several adjacent ones of the milking positions, a terminal unit (13) of a second kind arranged at the group of several adjacent ones of the milking positions and connected to said processing device (10), wherein

- said processing device (10) comprises

(i) means for automatically establishing, for each of said milking animals, a phase of the milking of the milking animal;

(ii) means for automatically selecting, for each of the terminal units of the first and/or second kind, portions of said information of the milking of said milking animals to be displayed by the terminal unit based on the established phases of the milking of the milking animals;

(iii) means for automatically transmitting, for each of the terminal units of the first and/or second kind, the selected portions of said information of the milking of said milking animals to the terminal unit; and

- each of said terminal units of the first and/or second kind is provided for automatically outputting the selected portions of said information of the milking of said milking animals as received from said processing device.

11. The arrangement of claim 10 wherein said means for automatically selecting is provided for selecting, for each of the terminal units of the second kind, different portions of said information of the milking of said milking animals to be displayed by the terminal unit of the second kind during different phases of the milking of the milking animals.

12. The arrangement of claim 11 wherein

- said different phases of the milking of the milking animals comprise an identification phase; and

- said means for automatically selecting is provided for selecting, for each of the terminal units of the second kind, information of verified, unverified, and missing identities of milking animals present at milking positions of the respective group (P1-P4, P5-P8, ...) of several adjacent ones of the milking positions to be displayed by the terminal unit of the second kind during said identification phase.

13. The arrangement of claim 11 or 12 wherein

- said different phases of said simultaneous milking of a plurality of milking animals comprise a stimulation phase; and

- said means for automatically selecting is provided for selecting, for each of the terminal units of the second kind, information of reminders supporting an operator (15) before milking of milking animals present at milking positions of the respective group of several adjacent ones of the milking positions to be displayed by the terminal unit of the second kind during said stimulation phase.

14. The arrangement of any of claims 11-13 wherein

- said different phases of said simultaneous milking of a plurality of milking animals comprise a milking phase; and

- said means for automatically selecting is provided for selecting, for each of the terminal units of the second kind, information of (i) reminders supporting an operator (15) during milking, and (ii) milk flow and/or yield of milking animals present at milking positions of the respective group of several adjacent ones of the milking positions to be displayed by the terminal unit of the second kind during said milking phase.

15. The arrangement of any of claims 11-14 wherein

- said different phases of said simultaneous milking of a plurality of milking animals comprise a post-milking phase; and

- said means for automatically selecting is provided for selecting, for each of the terminal units of the second kind, information of (i) reminders supporting an operator (15) after milking, (ii) termination of milking, and (iii) milk yield of milking animals present at milking positions of the respective

group of several adjacent ones of the milking positions to be displayed by the terminal unit of the second kind during said post-milking phase.

16. The arrangement of any of claims 10-15 wherein each of the terminal units of the second kind displays a respective field associated with a respective one of the milking positions of the respective group of several adjacent ones of the milking positions; and

- said means for automatically selecting is provided for selecting, for each of the fields, different information during different phases of the milking at the milking position associated with the field to be displayed by the terminal unit of the second kind.

17. The arrangement of any of claims 10-16 comprising means for storing user specific settings and associated user identities, and each of the terminal units of the second kind has means for using a stored user specific setting for an operator (15) having a user identity associated with the stored user specific setting.

18. A method in a milking system for simultaneous milking of a plurality of milking animals at a plurality of milking positions (P1-P24), wherein identities of said milking animals are established; wherein teat cups are attached to the teats of said milking animals and are connected to a source of vacuum to milk said milking animals; and wherein said method is c h a r a c t e r i z e d b y the steps of:

- gathering and processing information of the milking of said milking animals;

- for each of the milking positions, providing a terminal unit (11) of a first kind at the milking position (P1-P24); and

- for each group (P1-P4, P5-P8, ...) of several adjacent ones of the milking positions, providing a terminal unit (13) of a second kind at the group of several adjacent ones of the milking positions;

- automatically establishing, for each of said milking animals, a phase of the milking of the milking animal;

- automatically selecting, for each of said terminal units of the first and/or second kind, portions of said information of the milking of said milking animals to be displayed by the terminal unit based on the established phases of the milking of the milking animals;

- automatically transmitting, for each of the terminal units of the first and/or second kind, the selected portions of said information of the milking of said milking animals to the terminal unit; and

- by each of said terminal units of the first and/or second kind automatically outputting the selected portions of said information of the milking of said milking animals received from said processing device.

19. The method of claim 18 wherein, for each of the terminal units of the second kind, different portions of said information of the milking of said milking animals are selected and displayed by the terminal unit of the second kind during different phases of the milking of the milking animals.

20. An arrangement in a milking system for simultaneous milking of a plurality of milking animals, said milking system

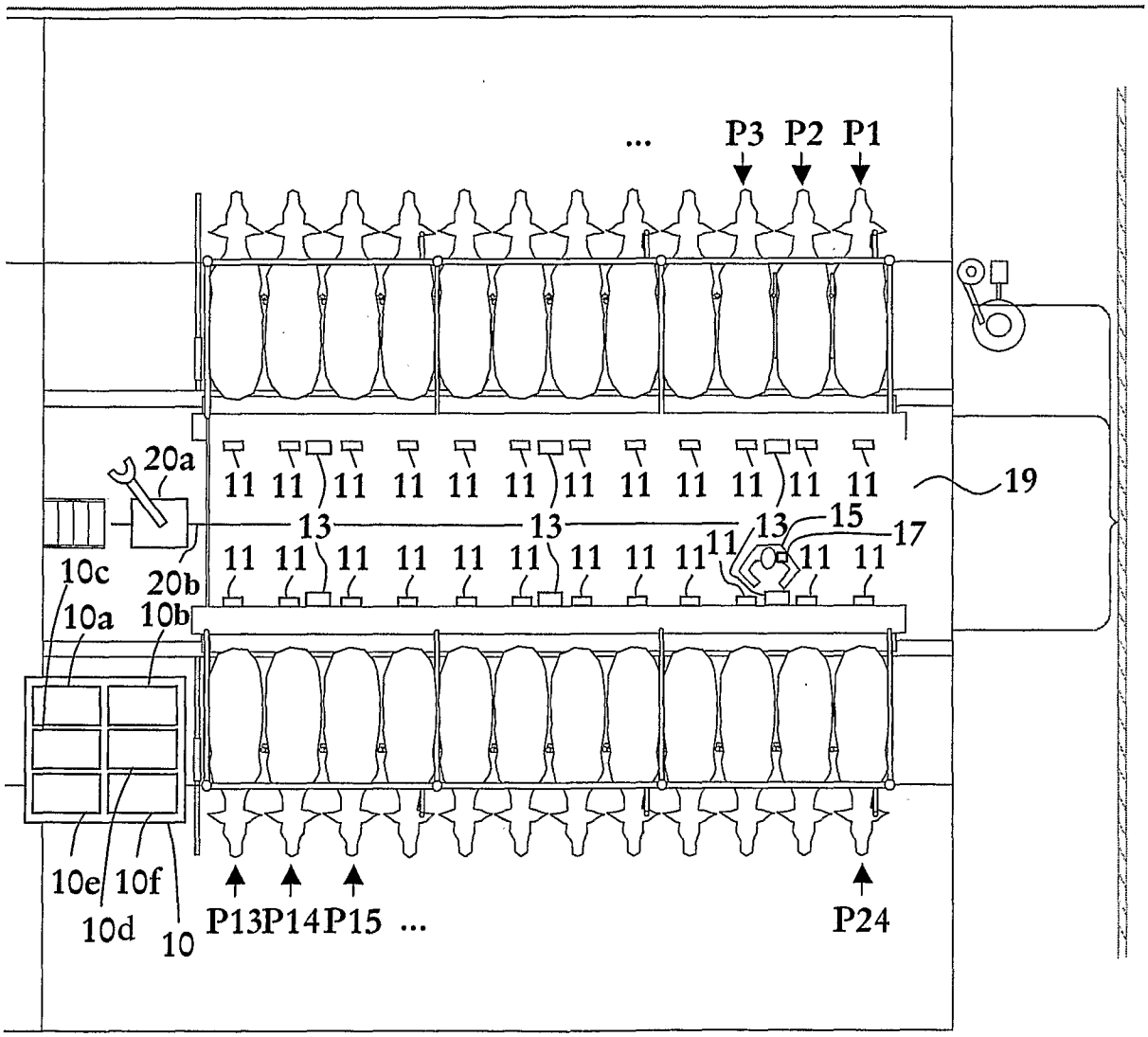
comprising a plurality of milking positions (P1-P24) and an arrangement provided for establishing identities of said milking animals, wherein each of the milking positions is provided with teat cups, which are attached to the teats of a milking animal and are connected to a source of vacuum to milk the milking animal, characterized in:

- for each of the milking positions, a terminal unit (11) of a first kind arranged at the milking position, connected to a processing device (10), and provided for displaying information of a first kind of the milking position;

- a portable terminal unit (17) wirelessly connected to said processing device (10) and comprising a position indicator device provided for indicating a position of said portable terminal unit; and

- means provided for automatically finding a group (P1-P4, P5-P8, ...) of one or several adjacent ones of the milking positions that are in proximity of said portable terminal unit based on said indicated position of said portable terminal unit, wherein

- said portable terminal unit (17) comprises means provided for automatically displaying information of a second kind of the group of one or several adjacent ones of the milking positions.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19
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P13
P14
P15
...
P24

Fig. 1

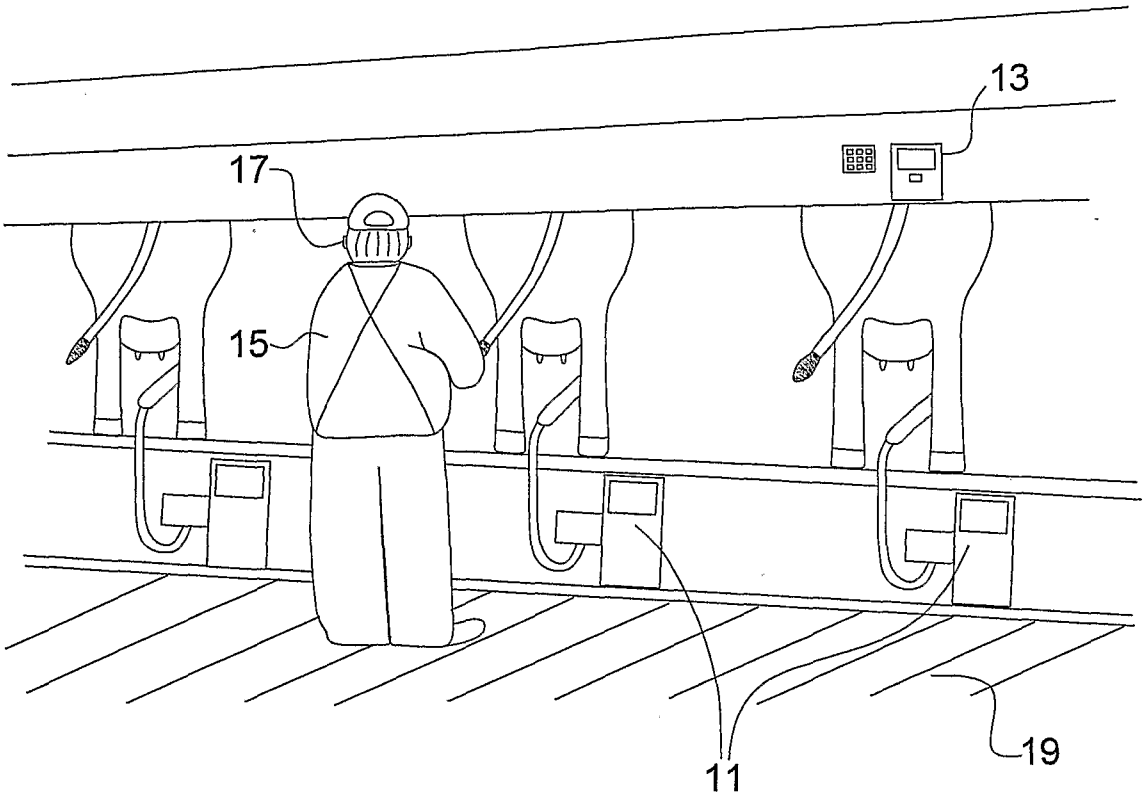


Fig. 2

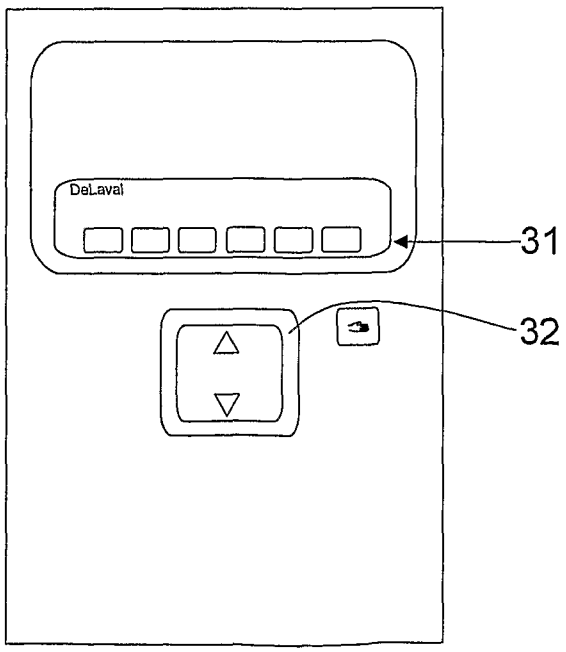
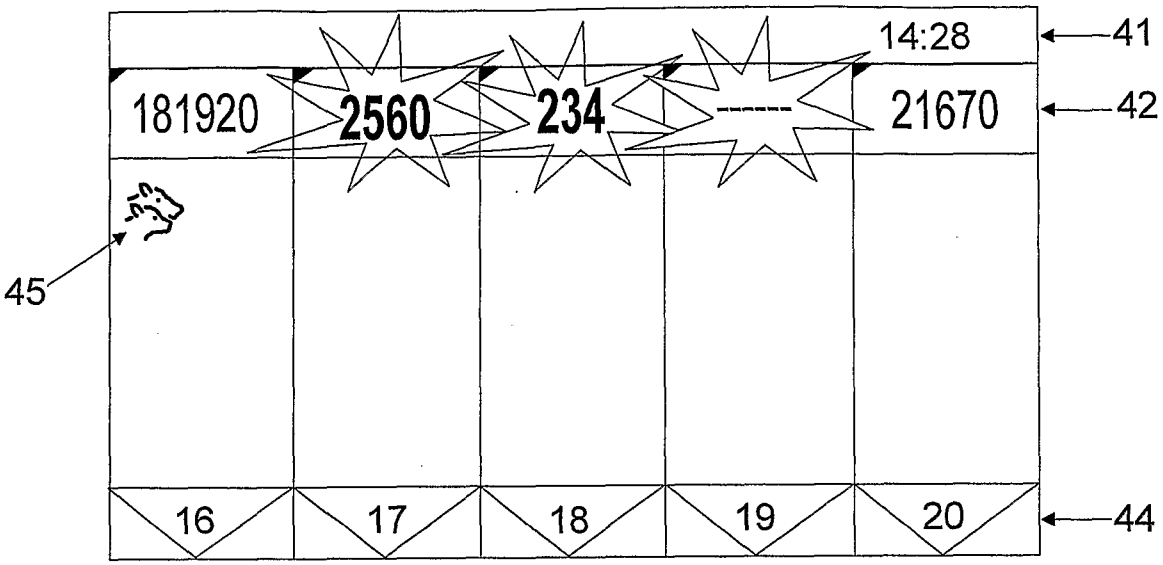


Fig. 3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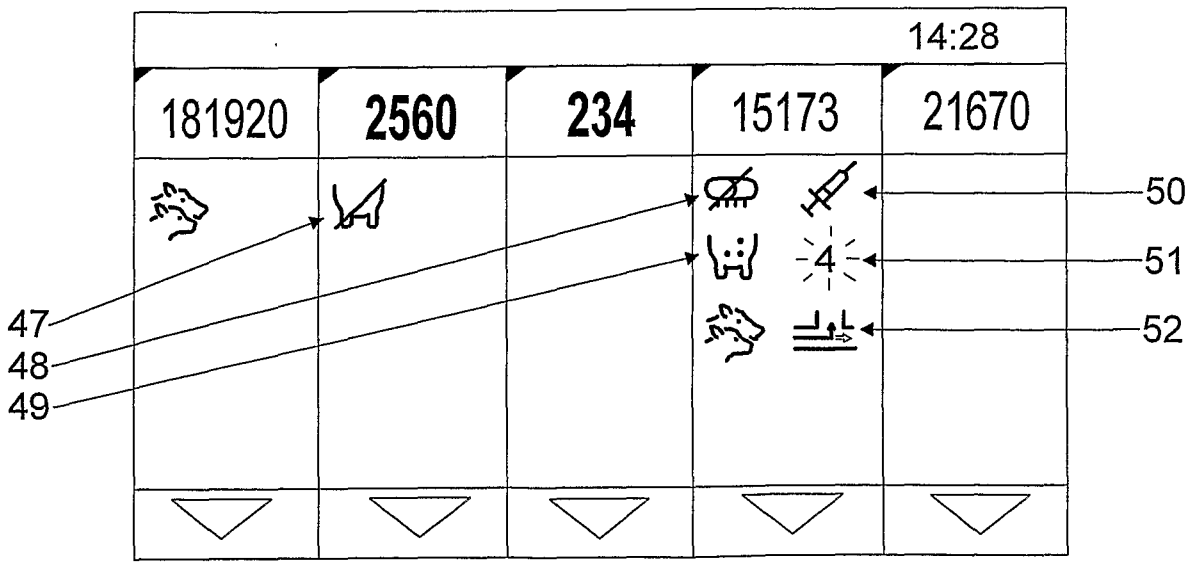
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Fig. 5

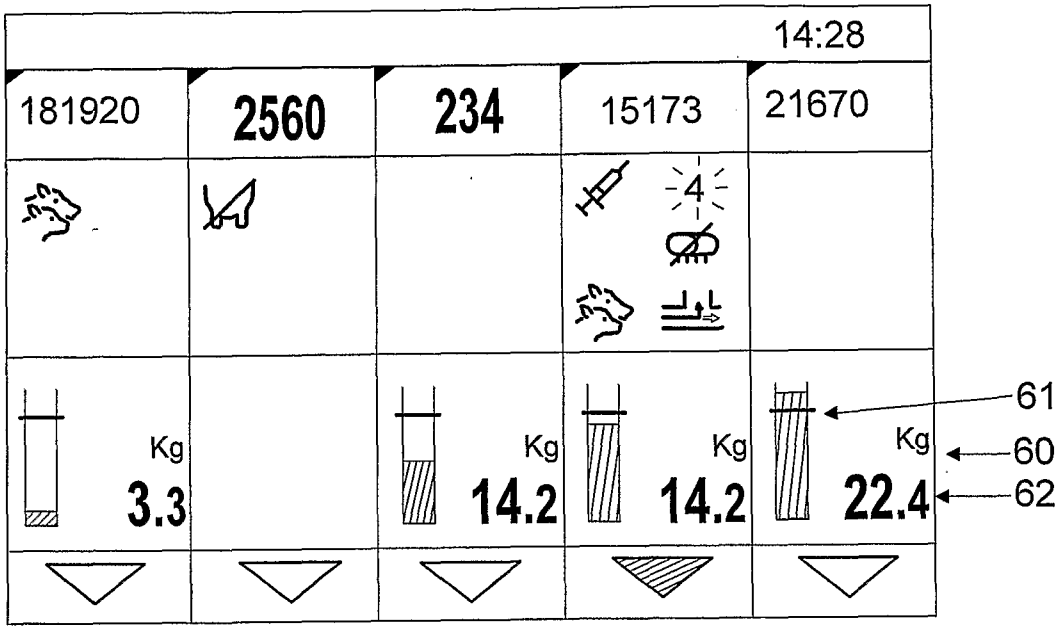
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Fig. 6

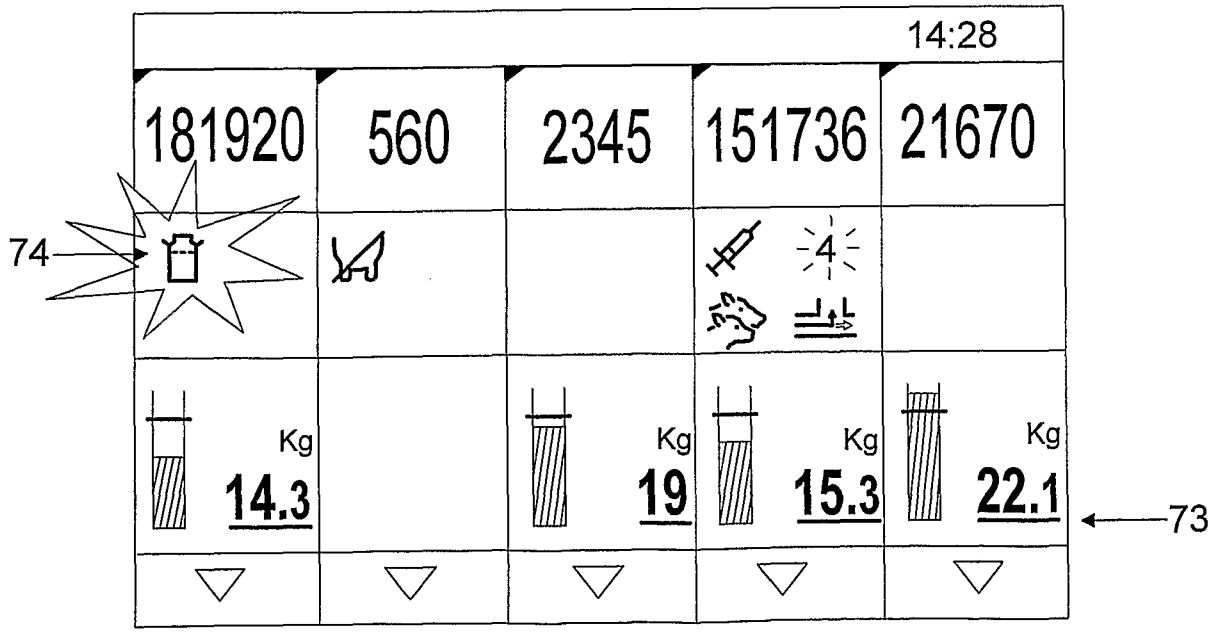
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Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2007/000810

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A01K, G06Q, A01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	JP 2001045898 A, ORION KIKAI KK, 2001-02-20; (abstract) Retrieved from: WPI database, WEEK 200125, AN 2001-240634 Original document: figures 1-3	1-20
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[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
16 January 2008	17 -01- 2008
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Magnus Thorén / MRo Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2007/000810

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2007/000810

International patent classification (IPC)

A01K 1/12 (2006.01)
A01J 5/007 (2006.01)
G06Q 50/00 (2006.01)

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Cited literature, if any, will be enclosed in paper form.

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