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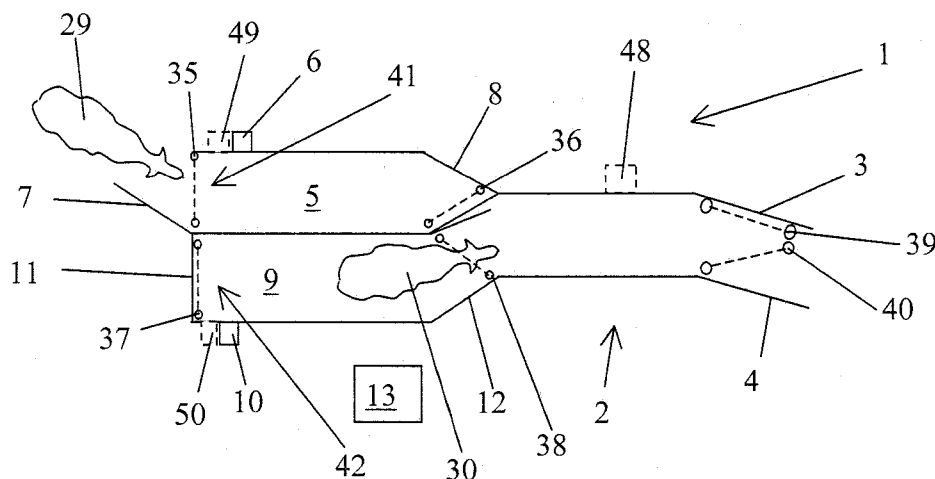
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(54) Title: SLUICING ARRANGEMENT FOR ANIMALS



(57) Abstract: A sluing arrangement (1) for directing animals (28, 29, 30) from a first area to one of at least a second area and a third area is disclosed as well as a milking arrangement with such a sluing arrangement. The sluing arrangement comprises a directing device (2) comprising at least a first directing gate (3) arranged to lead to the second area and a second directing gate (4) arranged to lead to the third area. The sluing arrangement (1) comprises at least a first entrance device (5) and a second entrance device (9), each comprising an exit gate (8, 12) leading to the directing device (2), and each being arranged to determine the identity of an animal (28, 29, 30) in the respective entrance device (5, 9). The sluing arrangement (1) is arranged to slue animals (28, 29, 30) to the second area or the third area based on their identity.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

SLUICING ARRANGEMENT FOR ANIMALS

Technical field

5 The invention relates to a sluicing arrangement for directing animals from a first area to one of a second area and a third area as defined in the introductory part of the independent claim directed to a sluicing arrangement. The invention also relates to an arrangement for animals wherein animals are to be directed from a first area to one of a second area and a third area.

10

Description of the prior art

Arrangements for voluntary automatic milking of animals have been used for some years. Such arrangements usually comprise a stall, a resting area, a feeding area, and a milking area comprising at least one milking robot for applying teat cups to the animals. In such arrangements the animals may be free to move around between the resting area, the feeding area, and the milking area. Such arrangements may be arranged for the animals to voluntarily attend to the milking robot when the animals desire to be milked.

20

A problem with such a voluntary milking system where the animals are free to move between the milking area, the feeding area and the resting area is that they move between these areas in a way that is far from optimum, with regard to the milk production.

25

In the international application WO 96/03031 a device and method for automatically milking of animals is disclosed. In the device disclosed in WO 96/03031 the animals are guided from a resting and walking area via an access sluice either to a milking stall or to a feeding and watering space dependent on whether the animal is allowed to be milked or not. After milking the animals may enter the feeding and watering space, and after feeding the animals may return to the resting and walking area via a one-directional gate. As the animals have to attend to the sluice in order to get to the feeding and watering space, the animals are stimulated to attend to the milking stall in a device according to WO 96/03031.

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However, it is believed that animals do not always attend to the sluice as often as would be optimum for the milk production. In such an arrangement as shown in said international application some animals rest longer than optimum before attempting to move to the feeding and watering space.

In the international application WO2006/038840 a milking arrangement for automatic milking of animals and a method for managing animals in such an arrangement is disclosed. In the milking arrangement the animals are free to move from the resting area to the feeding area through a oneway gate. An access device is arranged at the exit of the feeding area. The access device identifies the animal and determines whether or not the animal should be allowed to enter the milking area. In case the animal is allowed to enter the milking area the access device opens a first gate leading to the milking area. In case the animal is not allowed to enter the milking area the access device opens a second gate leading to the resting area.

It has however been found that there is an upper limit on the number of animals that may be served by a single access device. Furthermore, it is difficult to arrange two access devices in parallel as the paths from the gates of the different access devices has to cross each other. This problem is present in all milking arrangements where an access device is used to direct animals from a first area to one of a second area and a third area.

A further problem is that most animals that live in groups develop a hierarchy in the group. When more than one animal is present in front of the access device, the animal having the highest position in the hierarchy is most likely to enter the access device first. This may lead to a situation where an animal has to wait a very long time in front of the access device.

Description of the invention

An object of the present invention is to provide a sluicing arrangement for animals and a milking arrangement for automatic milking of animals

comprising such a sluicing arrangement, which at least alleviates the problems with the prior art.

5 Another object of the present invention is to provide an arrangement for sluicing animals to one of two different areas which is more effective than arrangements of the prior art.

10 Still another object of the present invention is to provide an arrangement automatic milking of animals comprising a sluicing arrangement for sluicing animals to one of two different areas, which arrangement is more effective than arrangements of the prior art.

15 At least one of these objects are provided with a sluicing arrangement and a milking arrangement according to the appended claims.

Further advantages of the invention are provided with the features of the dependent claims.

20 A basic idea of the present invention is to arrange two entrance devices in parallel, wherein the exit gates of the entrance devices lead to a common directing device which may direct the animals to one of at least two different areas.

25 According to a first aspect of the present invention a sluicing arrangement for directing animals from at least a first area to one of at least a second area and a third area is provided. The sluicing arrangement comprises means to identify the animals, and a directing device arranged to lead the animals to the second area or to the third area, . The sluicing arrangement is characterized in that it comprises at
30 least a first entrance device and a second entrance device, each comprising an entrance from the first area and an exit gate leading to the directing device, wherein the exit gate of only one entrance device is arranged to be open at a time, wherein the sluicing arrangement is arranged to sluice animals to the second area or the third area based on
35 their identity.

The means to identify the animals may be arranged either in each one of the entrance devices or in the directing device.

A sluicing arrangement according to the invention may direct more animals per time unit than the sluicing arrangements according to the prior art. When a first animal is directed into the correct area a second
5 animal may be identified. This leads to a higher efficiency of the sluicing arrangement. Furthermore, an animal having a low position in the hierarchy does not have to wait as long before entering a sluicing arrangement according to the present invention as with the prior art
10 sluicing arrangements. This is due to the fact that there are two entrances in a sluicing arrangement according to the present invention, which increases the possibility for an animal to enter the sluicing arrangement.

The number of areas to which animals may be directed from the first
15 area may, as is indicated above, be more than two. In case the sluicing arrangement is arranged in a milking arrangement the directing device may direct animals to one of , e.g., three different areas. Said three areas may be , e.g., a milking area, a resting area and an observation area into which sick animals are directed

20 Similarly, it is possible that the first entrance device is connected to one area and that the second entrance device is connected to another area.

The directing device may comprise a first directing gate arranged to lead
25 the animals to the second area and a second directing gate arranged to lead the animals to the third area, wherein only one of the directing gates is arranged to be open at a time. Alternatively, the directing device may comprise only one gate which is arranged to block the passage to either the second area or to the third area. In case the directing device is
30 arranged to direct animals to more than two areas the directing device may be arranged in other ways. The directing device may be arranged in any suitable way to direct animals from a first area to one of the other areas.

35 The sluicing arrangement may comprise a control unit controlling the exit gates of the entrance devices and the directing device based on information on the identity of the animals. It is also possible to have

multiple control units in a sluicing arrangement according to the invention. The control unit may be a programmable computer but may also be a specialised hardwired control unit.

- 5 The sluicing arrangement may be arranged to determine to which area the animal is to be directed based on the identity of the animal and earlier stored data on the animal. Thus, the animals may be directed to the correct area based on a variable parameter, which may be updated and stored as data on the animal.

10

The earlier stored data on the animal may comprise information on the time that has elapsed since the last milking of the animal in case the sluicing arrangement is arranged in a milking arrangement.

- 15 The sluicing arrangement may comprise a first sensor means arranged to determine whether or not there is an animal present in the directing device. By having such a sensor means it is possible to determine when an animal has entered the directing device or has left the directing device, and to avoid that more than one animal enters the direction
20 device at a time.

The first sensor means may comprise a sensor at each one of the exit gates of the entrance devices and each one of the directing gates. The sensors may be arranged to sense when an animal passes the sensors.

- 25 The sensor means may be arranged to determine whether or not there is an animal present in the directing device based on the passes past the sensors. Such sensors may comprise photocells, which are arranged to sense when an animal passes into or out of the direction device.

- 30 As an alternative, the first sensor means may comprise a presence sensor, such as ,e.g., a camera, which is arranged to sense whether or not there is any animal present in the directing device.

- 35 The sluicing arrangement may also comprise second sensor means arranged to determine whether or not there is an animal present in any one of the entrance devices. This makes it possible to determine when

an animal enters or leaves any one of the entrance devices, and to avoid that more than one animal at a time is present in the entrance devices.

5 The second sensor means may comprise a sensor at each one of the entrance gates and each one of the exit gates of the entrance devices. The sensors may be arranged to sense when an animal passes the sensors. The second sensor means may be arranged to determine whether or not there is an animal present in any one of the entrance devices based on the passes past the sensors. Such sensors may
10 comprise photocells, which are arranged to sense when an animal passes into or out of the entrance devices.

As an alternative, the second sensor means may comprise a first presence sensor which is arranged to sense whether there is any animal
15 present in the first entrance device, and a second presence sensor which is arranged to sense whether there is any animal present in the second entrance device

The presence sensors may be, e.g., a camera or a photocell, which senses the presence of an animal in the entrance devices.
20

The sluicing arrangement may comprise an entrance gate at the entrance of each one of the entrance devices. Such entrance gates hinders animals from entering the entrance devices when an animal is already present in the entrance device.
25

The sluicing arrangement may be arranged in such a way that when more than one animal is present in the entrance devices, the animal that first entered into one of the entrance devices is allowed to pass first through the directing device.
30

The identification means may comprise a first animal identification means in the first entrance device and a second animal identification means in the second entrance device. This arrangement of the identification means contributes to the possibility of sluicing many
35 animals per time unit through the sluicing arrangement as the animal in the first entrance device may be identified at the same time as the the

animal in the second entrance device is sluiced through the directing device.

5 The sluicing arrangement may be arranged in such a way that when more than one animal is present in the entrance devices, the earliest identified animal is allowed to pass first through the directing device. This maximises the throughput of animals in the sluicing arrangement. The sluicing arrangement may also be arranged to let animals pass in an order based on their identity. In this way the earliest identified animal
10 may pass into the directing device irrespective of the position of the animal in the hierarchy.

According to a second aspect of the present invention an arrangement for managing animals comprising a first area, a second area and a third
15 area is provided. The arrangement is characterized in that the arrangement comprises a sluicing arrangement according to anyone of the preceding claims.

According to a third aspect of the present invention an arrangement for
20 managing animals is provided. The arrangement comprises a first area, a second area, a third area, and a fourth area. The arrangement is characterized in that it comprises a sluicing arrangement according to anyone of the preceding claims, wherein the first entrance device is connected to the first area and the second entrance device is connected
25 to the fourth area, and the directing device is arranged to direct animals to the second area.

According to a fourth aspect of the present invention a milking
arrangement for automatic milking of animals is provided. The milking
30 arrangement comprises a feeding area arranged for supplying fodder to the animals, a resting area arranged for allowing the animals to rest, a milking area with at least one milking station provided with means for attachment of teat cups, milking and detachment of the teat cups, which areas constitutes a first area, a second area and a third area, and a
35 sluicing arrangement to direct animals from the first area to one of the second area and the third area. The milking arrangement is charac-

terized in that the milking arrangement comprises a sluicing arrangement according to the first aspect of the invention.

5 A milking arrangement according to the third aspect of the present invention provides for a more efficient sluicing of animals from the first area to one of the second area and the third area.

10 The first area may be the feeding area, the second area may be the resting area and the third area may be the milking area.

In the following preferred embodiments of the present invention will be described with reference to the appended drawings.

Short description of the drawings

15 Fig 1 shows a sluicing arrangement according to an embodiment of the present invention.

20 Fig 2 shows a milking arrangement comprising a sluicing arrangement according to an embodiment of the present invention.

Fig 3 shows a sluicing arrangement according to a second embodiment of the present invention.

25 Fig 4 shows schematically an arrangement comprising five areas and a sluicing arrangement according to an embodiment of the present invention.

Detailed description of preferred embodiments of the invention

30 In the following embodiments of the invention will be described with reference to the appended drawings, in which similar features are denoted with the same reference numeral.

35 Fig 1 shows a sluicing arrangement 1 according to an embodiment of the present invention, for sluicing animals from a first area to one of a second area and a third area. The sluicing arrangement 1 comprises a directing device 2 which comprises a first directing gate 3 arranged to lead to a second area and a second directing gate 4 arranged to lead to

the third area. The first area, the second area and the third area are not shown in Fig 1. The sluicing arrangement 1 also comprises a first entrance device 5 comprising a first animal identification means 6, a first entrance 41 with a first entrance gate 7 arranged to lead from a first area (not shown), and a first exit gate 8 arranged to lead to the directing device 2. Furthermore, the sluicing arrangement comprises a second entrance device 9 comprising a second animal identification means 10, a second entrance 42 with a second entrance gate 11 and a second exit gate 12. The sluicing arrangement 1 also comprises a control unit 13 which is arranged to control the entrance gates 7, 11, the exit gates 8, 12, and the directing gates 3, 4. Fig 1 also shows a first animal 29 entering the first entrance device 5 through the first entrance gate and a second animal 30 leaving the second entrance device 9 through the second exit gate 12. A first sensor 35 is arranged at the first entrance gate 7 and a second sensor 36 is arranged at the first exit gate 8. Similarly, a third sensor 37 is arranged at the second entrance gate 11 and a fourth sensor 38 is arranged at the second exit gate 12. A fifth sensor 39 and a sixth sensor are arranged at the first directing gate 3 and the second directing gate 4, respectively. The sensors 35-40 are connected to the control unit 13. The control unit is arranged to determine whether or not there is an animal present in the directing device 2, or any of the entrance devices 5, 9, based on the information from the sensors 35-40.

As an alternative some or all of the first sensor 35, the second sensor 36, the third sensor 37, the fourth sensor 38, the fifth sensor 39, and the sixth sensor 40, may be replaced by a first presence sensor 48 arranged to sense whether or not there is an animal 28, 29, 30, present in the directing device 2, and/or a second presence sensor 49 arranged to sense whether or not there is an animal 28, 29, 30, present in the first entrance device 5, and/or a third presence sensor 50 arranged to sense whether or not there is an animal 28, 29, 30, present in the second entrance device 9. The presence sensors may, e.g., be a camera or a photocell.

Fig 2 shows a milking arrangement 15 for milking animals 28 comprising a sluicing arrangement 1 according to an embodiment of the present

invention. The milking arrangement 15 comprises a first area 51 in the form of a feeding area arranged for supplying fodder to the animals, a second area in the form of a resting area 52 arranged for allowing the animals to rest, and a third area 53 in the form of a milking area with milking stations provided with means for attachment of teat cups, milking and detachment of the teat cups. The resting area 52 is provided with cubicles/resting places 19 and water bowls 20. The milking area 53 is provided with a first milking station 21 and a second milking station 22. The feeding area 51 is provided with feeding devices 23 and water bowls 20. An exit door 24 and an entrance door 25 are provided for allowing animals to pass between the feeding area 51 and pasture and grazing areas surrounding the milking arrangement 15. In this way such areas are integrated with the feeding area 51 during the outdoor season. A number of water bowls 20 may be provided in the feeding area 51 as well as in the resting area 52, only a few of which have been disclosed in each area 52, 51, not to burden the drawing. Each feeding device 23 comprises an animal identification means 26 and a feeding control means 27 for control of the feeding device 23 dependent on the identity of the animal 28. More specifically, the control means 27 controls the amount and/or the speed with which fodder is dispensed and/or the composition of the fodder in the feeding device 23. It is within the scope of the invention to provide a more simple feeding device 23. The feeding device 23 may according to another embodiment of the present invention be an ordinary feeding table on which fodder is arranged manually, by an operator of the milking arrangement 15, or automatically. In such an embodiment it is not necessary to provide any identification means.

For illustrative reasons the lay-out in Fig 2 has not been drawn in scale, meaning that the number of cubicles/resting places 19 and the extent of the feeding devices 23 are less than in the actual installation, which is intended for 100 to 120 cows. This follows from the fact that two automatic milking stations 21, 22, are provided in the milking area 53, each servicing around 50 to 60 cows. The adaptation of this layout to said number of cows may easily be taken care of by increasing the size of the barn while maintaining the inventive ideas behind the methods for feeding and animal traffic control illustrated in the drawing. Consequently, if the milking arrangement 15 is intended for 50-60 animals it is sufficient

with one automatic milking station 21, 22. The number of animals for which the milking arrangement 15 is intended is, however, not important for the present invention.

5 A oneway gate 33 is arranged between the resting area 52 and the feeding area 51 allowing animals to pass only in the direction from the resting area 52 to the feeding area 51 as indicated by the arrow 34. A sluicing arrangement 1 is arranged between the feeding area 51 and the milking area 53. The sluicing arrangement is arranged as has been
10 described in relation to Fig 1.

The milking area 53 comprises a first automatic milking station 21, and a second automatic milking station 22 including means for attachment of
15 teat cups to the teats of the cow, milking the cow and detachment of the teat cups after milking has ended. Preferably, each of said stations is implemented by a DeLaval Voluntary Milking System VMS, including all means necessary for identification of the cow, milking, measurement of
20 milk yield and quality, calculating health status data of the cow and providing an individual amount and composition of concentrate during milking.

Each milking station 21 and 22 is provided with an entrance gate 31 and an exit gate 32. The drawing shows that an animal 28 is being milked in
25 the second milking station 22, of which the entrance gate 31 and the exit gate 32 are both closed. Another animal 28 is entering the first milking station 21 of which the entrance gate 29 is open and the exit gate 28 is closed. Swing gates 36 are provided after the exit gates 32 hindering animals from walking back into one of the milking stations 21, 22. The entrance gate 31 also functions as directing means directing an animal
30 28 in the milking area 53 into a milking station 21, 22.

The operation of the milking arrangement 1 shown in Fig 2 may be described starting with an animal 28 in one of the resting places 19. When the animal 28 is hungry the animal 28 may freely move into the
35 feeding area 51 where the animal 9 may eat from the the feeding devices 23 and/or drink from the water bowls 20. When the animal 28 attends one of the feeding devices 23 comprising an animal identification means

26, the animal identification means 26 will identify the animal and the control means 27 will control the feeding device 23 to distribute the correct amount of fodder to the animal 28.

5 After having finished eating the animal may leave the feeding area 51 by entering the sluicing arrangement 1. When the first animal 29 enters the first entrance device 5, as is shown in Fig 1, the first sensor senses that an animal is present in the first entrance device 5. When the first animal 10 29 has passed the first sensor 35 the first entrance gate 7 is closed by the control device. The first animal 29 is then identified by the first animal identification means 6. The second animal 30 has already been identified by the second animal identification means 10. After identification of the second animal 30 the control unit 13 retrieves earlier saved data for the animal and makes a decision on whether the animal is 15 to be milked or not. In the shown embodiments the control unit 13 has made the decision that the second animal is to be milked. After the decision has been made by the control unit 13, the control unit opens the second directing gate 4 and also the exit gate 12 of the second entrance device to allow the animal to pass into the milking area 53. After the 20 second animal has passed the fourth sensor 38 control unit closes the exit gate of the second entrance device 9 and opens the entrance gate 11 of the second entrance device 9 to allow another animal to enter the second entrance device 9. While the second animal passed the directing device 2 the first animal identification means 6 has identified the first animal in the first identification device. Thus, the control unit 13 has 25 received information on the identity of the first animal and has made a decision on where the first animal is to be directed. The corresponding directing gate as well as the exit gate of the first entrance device 5 may thus be opened as soon as the second animal 30 has passed the sixth 30 sensor 40.

The decision whether the animal is to be directed into the milking area or into the resting area may, e.g., be based on historical milkings, i.e. how long time that has elapsed since the last milking and any earlier milkings.

35

When one of the milking stations 52, 53 in the milking area 3 is idle the access gate 35 and the entrance gate 31 of the idle milking station is

opened allowing an animal 9 in the waiting area 23 to enter the milking area 3 and the idle milking station. Concentrated fodder is provided within each one of the milking stations 52, 53, tempting the animal 9 to enter the milking station. After an animal has entered the milking station the entrance gate 31 is closed and milking of the animal 9 commences. After milking has finished the exit gate 32 of the milking station 52, 53, is opened and the animal may exit the milking station and go through one of the swing gates 36 to leave the milking area 53.

Fig 3 shows a sluicing arrangement 1 according to a second embodiment of the present invention, for sluicing animals from a first area to one of a second area and a third area. Only the differences between this embodiment and the embodiment shown in Fig 1 will be described. The directing device 2 comprises a common directing gate 43 directing animals to either the second area or to the third area. In the figure the directing gate 43 is shown in a position where animals are directed to the second area. The dotted line 44 shows the directing gate 43 in the position where animals are directed to the third area. A first sensor 45 is arranged to detect animals entering the directing device 2 and a second sensor 46 is arranged to detect animals leaving the directing device 2. An animal identification means 47 is arranged at the directing device 2 to identify animals in the directing device 2.

Fig 4 shows schematically an arrangement 60 comprising five areas and a sluicing arrangement according to an embodiment of the present invention. The arrangement will only be described schematically to show the possibilities of using a sluicing arrangement according to the invention to sluice animals from one of at least two areas to one of at least three areas. The arrangement has a first area 51, a second area 52, a third area 53, a fourth area 54 and a fifth area 55. A sluicing arrangement 1 is arranged to sluice animals from one of the first area 51 and the fourth area 54 to one of the second area 52, the third area 53 and the fifth area 55. To this end the first area 51 is connected to the first entrance device 5 while the fourth area 54 is connected to the fourth entrance device 9. The directing device 2 comprises a first directing gate 56 leading to the second area 52, a second directing gate 57 leading to the third area 53, and a third directing gate 58 leading to the fifth area

55. The arrangement 60 also comprises oneway gates 59 allowing the animals 28 to get back to the first area 51 and the fourth area 54 from the second area 52, the third area 53, and the fifth area 55. The different areas 51-55 may have a number of different functions adapted to the needs of the owner of the arrangement 60.

The described embodiments may be amended in many ways without departing from the spirit and scope of invention which is limited only by the appended claims.

10

It is possible to use the sluicing arrangement according to the invention also in other arrangements than a milking arrangement. It is possible to implement the sluicing arrangement in any arrangement in which animals are to be directed from one area to one of a second and a third area.

15

CLAIMS

1. A sluicing arrangement (1) for directing animals (28, 29, 30) from at least a first area (51) to one of at least a second area (52) and a third area (53), comprising means to identify the animals, and a directing device (2) arranged to lead the animals to the second area or to the third area, **characterized in** that it comprises at least a first entrance device (5) and a second entrance device (9), each comprising an entrance (41, 42) from the first area and an exit gate (8, 12) leading to the directing device (2), wherein the exit gate (8, 12) of only one entrance device (5, 9) is arranged to be open at a time, and wherein the sluicing arrangement (1) is arranged to sluice animals (28, 29, 30) to the second area or the third area based on their identity.
2. The sluicing arrangement (1) according to claim 1, wherein the directing device (2) comprises a first directing gate (3) arranged to lead the animals (28, 29, 30) to the second area and a second directing gate (4) arranged to lead the animals to the third area, wherein only one of the directing gates (3,4) is arranged to be open at a time.
3. The sluicing arrangement (1) according to claim 1 or 2, comprising a control unit (13) controlling the exit gates (8, 12) of the entrance devices (5, 9) and the directing device (2) based on information on the identity of the animals (28, 29, 30).
4. The sluicing arrangement (1) according to claim 1, 2 or 3, wherein the sluicing arrangement (1) is arranged to determine to which area the animal (28, 29, 30) is to be directed based on the identity of the animal (28, 29, 30) and on earlier stored data on the animal.
5. The sluicing arrangement (1) according to claim 4, wherein the earlier stored data on the animal (28, 29, 30) comprises information on the time that has elapsed since the last milking of the animal (28, 29, 30).
6. The sluicing arrangement (1) according to anyone of the preceding claims, comprising a first sensor means arranged to determine whether or not there is an animal present in the directing device.

7. The sluicing arrangement according to claim 2 and 6, wherein the first sensor means comprises a sensor (36, 38, 39, 40) at each one of the exit gates (8, 12) of the entrance devices (5, 9) and each one of the directing gates (3, 4), which sensors (36, 38, 39, 40) are arranged to sense when an animal passes the sensors (36, 38, 39, 40), and wherein the sensor means is arranged to determine whether or not there is an animal present in the directing device based on the passes past the sensors (36, 38, 39, 40).
8. The sluicing arrangement according to claim 7, wherein the first sensor means comprises a presence sensor which is arranged to sense whether or not there is any animal present in the directing device.
9. The sluicing arrangement (1) according to anyone of the preceding claims, comprising second sensor means arranged to determine whether or not there is an animal present in any one of the entrance devices.
10. The sluicing arrangement (1) according to claim 9, wherein the second sensor means comprises a sensor (35, 37, 39, 40) at each one of the entrances (7, 11) and each one of the exit gates (8, 12) of the entrance devices (5, 9), which sensors (35, 37, 39, 40) are arranged to sense when an animal passes the sensors (35, 37, 39, 40), and wherein the sensor means is arranged to determine whether or not there is an animal present in the entrance devices based on the passes past the sensors (35, 37, 39, 40).
11. The sluicing arrangement according to claim 9, wherein the second sensor means comprises a first presence sensor which is arranged to sense whether there is any animal present in the first entrance device, and a second presence sensor which is arranged to sense whether there is any animal present in the second entrance device.
12. The sluicing arrangement (1) according to anyone of claims 9, 10 and 11, being arranged in such a way that when more than one animal is present in the entrance devices (5, 9), the animal (28, 29, 30) that first

entered into one of the entrance devices is allowed to pass first through the directing device.

5 13. The sluicing arrangement (1) according to anyone of the preceding claims, comprising an entrance gate (7,11) at the entrance (41, 42) of each one of the entrance devices (5, 9).

10 14. The sluicing arrangement (1) according to anyone of the preceding claims, wherein the identification means comprises a first animal identification means (6) in the first entrance device (5) and a second animal identification means (10) in the second entrance device (9).

15 15. The sluicing arrangement (1) according to claims 14, being arranged in such a way that when more than one animal is present in the entrance devices (5, 9), the earliest identified animal (28, 29, 30) is allowed to pass first through the directing device (2).

20 16. An arrangement (15) for managing animals comprising a first area, a second area and a third area, **characterized in** that the arrangement comprises a sluicing arrangement according to anyone of the preceding claims.

25 17. An arrangement (15) for managing animals comprising a first area (51), a second area (52), a third area (53), and a fourth area (54), **characterized in** that the arrangement comprises a sluicing arrangement according to anyone of the preceding claims, wherein the first entrance device 5 is connected to the first area (51) and the second entrance device (9) is connected to the fourth area (54), and wherein the directing device (2) is arranged to direct animals to the second area (52) or to the
30 third area (53).

35 18. A milking arrangement (15) for automatic milking of animals (28, 29, 30), comprising a feeding area (51) arranged for supplying fodder to the animals (28, 29, 30), a resting area (52) arranged for allowing the animals (28, 29, 30) to rest, a milking area (53) with at least one milking station (21, 22) provided with means for attachment of teat cups, milking and detachment of the teat cups, which areas (53, 51, 19) constitutes a

first area, a second area and a third area, and a sluicing arrangement (1) to direct animals from the first area to one of the second area and the third area, **characterized in** that the milking arrangement comprises a sluicing arrangement (1) according to anyone of claims 1-15.

5

19. The milking arrangement according to claim 18, wherein the first area is the feeding area (51), the second area is resting area (52) and the third area is the milking area (53).

10

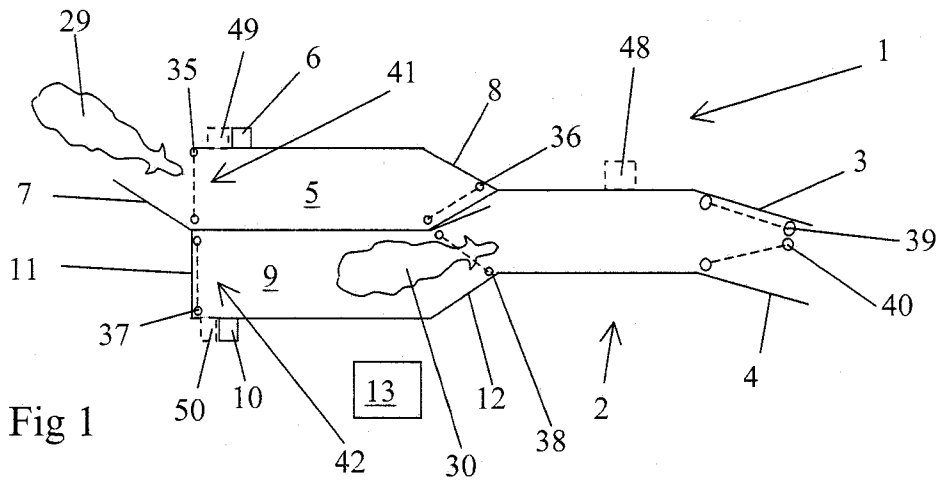


Fig 1

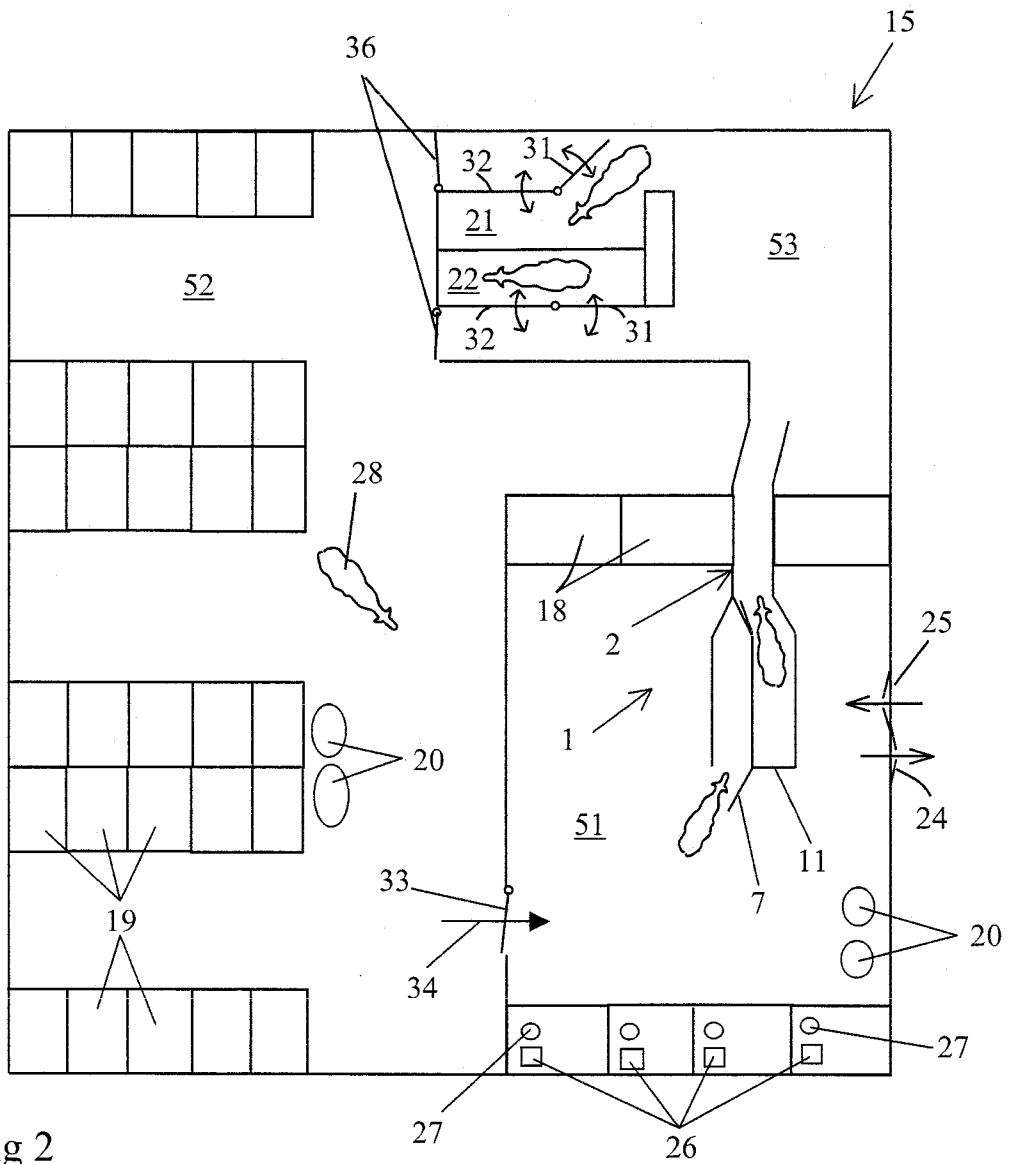


Fig 2

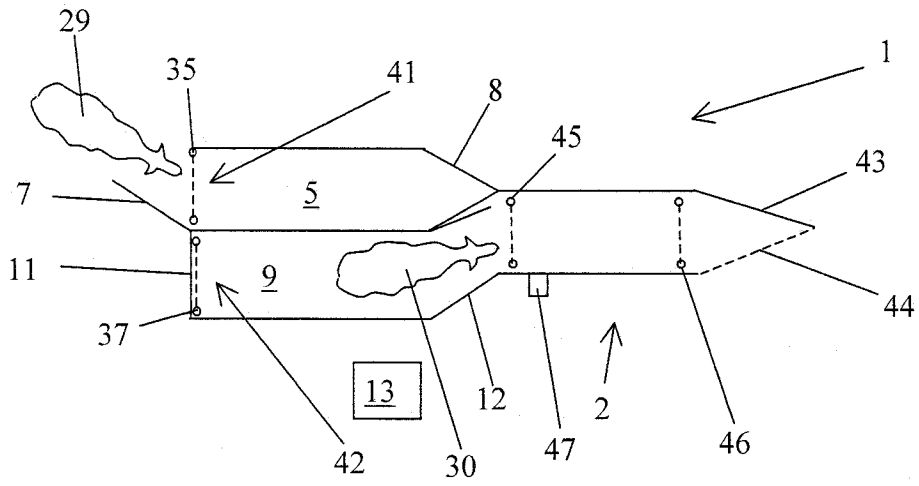


Fig 3

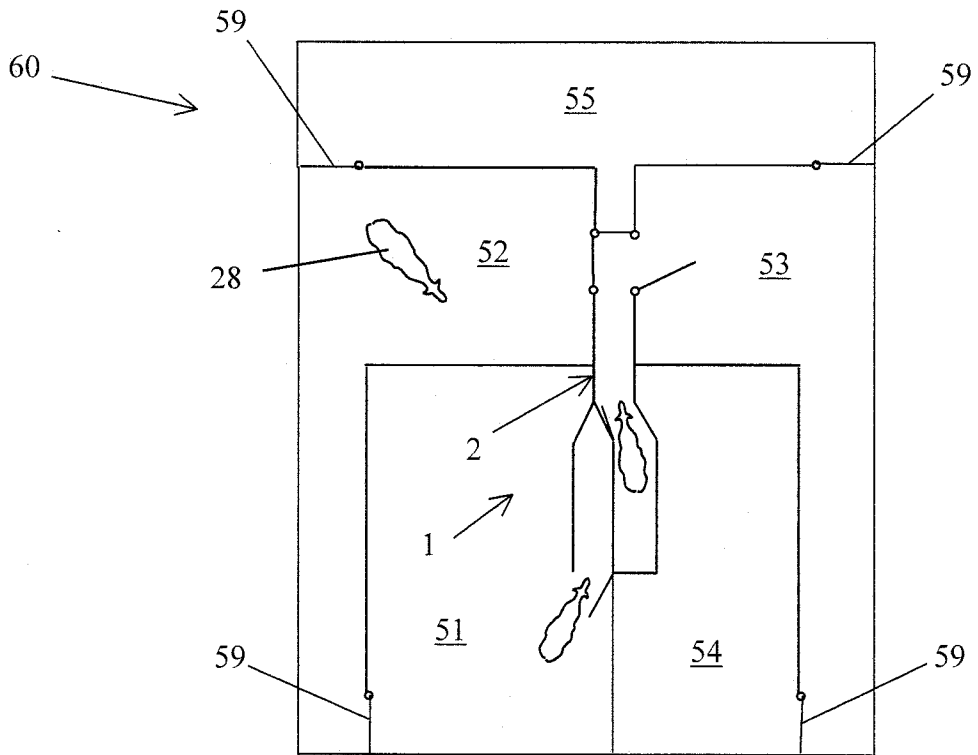


Fig 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2007/050460

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, 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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6571730 B1 (HENRIK NORBERG), 3 June 2003 (03.06.2003), column 1 - column 2; column 6, line 18 - line 60, figure 2	1,3-6,9, 11-16
Y	--	18
Y	WO 03086058 A1 (DELAVAL HOLDING AB), 23 October 2003 (23.10.2003), figure 2	18
A	--	1-19
A	WO 2006038840 A1 (DELAVAL HOLDING AB), 13 April 2006 (13.04.2006), page 1 - page 5; page 10, line 15 - line 35, figure 2	1-19
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Further documents are listed in the continuation of Box C. See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search	Date of mailing of the international search report
4 October 2007	09-10-2007

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 / JA A Telephone No. +46 8 782 25 00
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2007/050460

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9603031 A1 (PROLION B.V.), 8 February 1996 (08.02.1996), whole document -- -----	1-19

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2007/050460

International patent classification (IPC)

A01K 1/12 (2006.01)

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Use the application number as username.

The password is **QGTMCBCZQC**.

Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

01/09/2007

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PCT/SE2007/050460

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