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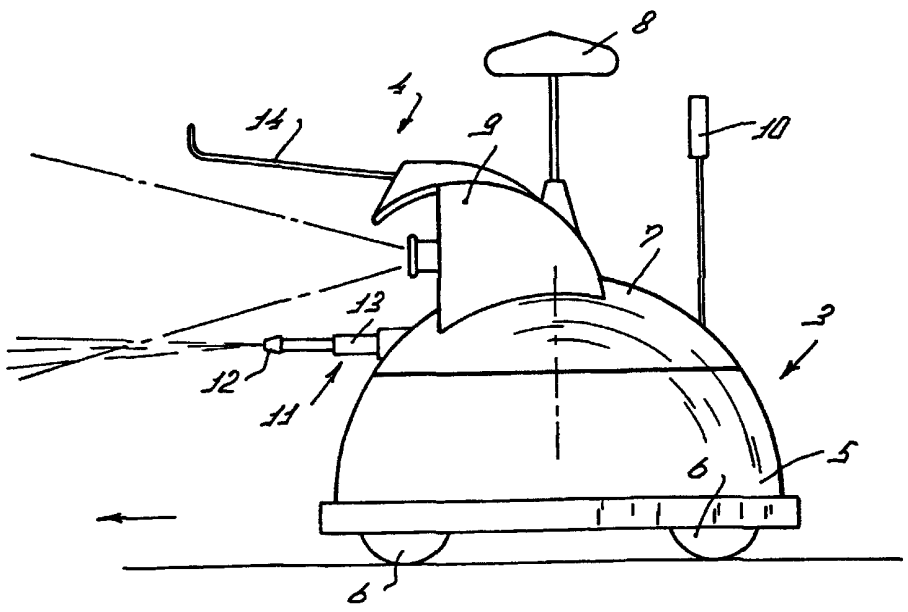
(54) Title: AN UNMANNED VEHICLE TO BE USED IN A STABLE OR A MEADOW




(57) Abstract: The invention relates to an unmanned vehicle to be used in a stable (1), such as e.g. a cowshed, or in a meadow. The unmanned vehicle (3) is provided with detection means (4) for determining the health and/or the behaviour of animals. The detection means (4) comprise an animal identification system and/or a radar (8) and/or a camera (9). The unmanned vehicle (3) is further provided with driving means (14) for driving animals. On the unmanned vehicle (3) there are further provided disinfecting means (11) for disinfecting at least a part of the stable (1) and/or a part of an animal.

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# AN UNMANNED VEHICLE TO BE USED IN A STABLE OR A MEADOW

The invention relates to an unmanned vehicle to be used in a stable, such as e.g. a cowshed, or in a meadow.

Such a vehicle is known.

The known vehicle is usually employed for cleaning the stable floor.

It is an objective of the invention to provide a multifunctional, unmanned vehicle.

In accordance with the invention, this is achieved in that the unmanned vehicle is provided with detection means for determining the health and/or the behaviour of animals. With the aid of its detection means the unmanned vehicle is capable of identifying animals which are ill and/or display abnormal behaviour. According to an inventive feature, the unmanned vehicle comprises alarm means for alarming a supervisor when an animal is ill or displays abnormal behaviour. In this manner it is possible to react quickly and adequately when there is something wrong with an animal.

According to a further inventive feature, the detection means comprise an animal identification system provided with a transmitter and a receiver. By means of the animal identification system there is determined for example whether an animal is lying or standing longer than usually at a certain place. This may be an indication that the animal is ill. According to another inventive feature, the animal identification system comprises a radar as well as reflectors reacting on the radar, which are disposed on the animals. Each of these reflectors has a unique code, so that it is possible to determine per animal how the animal is moving. In this manner it is also possible to determine abnormal behaviour of the animals. According to another inventive feature, the detection means comprise a camera, preferably constituted by an infrared camera. By means of image analysis of the images of the animals recorded by the camera it is possible for example to determine whether an animal has mastitis or is injured or has to be inseminated. It is also possible to track the animals by means of the camera. For enabling a still

better view of the animals, the detection means are disposed on a telescopic carrier. According to again another inventive feature, the unmanned vehicle comprises driving means for driving the animals. With the aid of the driving means animals can be separated from a group, e.g. for the purpose of being inseminated or examined by a veterinary surgeon. In a preferred embodiment of the invention, the driving means comprise an electric shock device.

According to another aspect of the invention, the unmanned vehicle comprises disinfecting means for disinfecting at least a part of the stable and/or a part of an animal. According to again another aspect of the invention, the disinfecting means are disposed on a telescopic carrier. The latter measure makes it possible to disinfect at places which are difficult to reach. For the purpose of rendering the unmanned vehicle still more multifunctional, it is provided with a manure slide for removing manure which is lying on a floor. According to another inventive feature, the unmanned vehicle is provided with navigation means for guiding the unmanned vehicle through the stable or the meadow. The navigation means may be the same as the above-described detection means.

The invention will now be explained in further detail with reference to the accompanying drawings.

Figure 1 is a plan view of a stable with an unmanned vehicle accommodated therein, which vehicle is provided with detection means according to the invention, and

Figure 2 is a side view of the unmanned vehicle shown in Figure 1.

Figure 1 is a plan view of a stable 1 provided with a milking robot 2 for automatically milking animals and an unmanned vehicle 3 which is provided with detection means 4 for determining the health and/or the behaviour of animals.

Figure 2 is a side view of the unmanned vehicle 3 according to the invention, which is provided with a chassis 5

with wheels 6. The wheels 6 are driven by a (non-shown) drive unit. On the chassis 5 there is disposed a rotatable upper part 7 on which the detection means 4 are mounted. In the present embodiment the detection means 4 comprise a radar 8 and a camera 9. The unmanned vehicle 3 is further provided with a transmitter unit including a transmitting element 10. By means of the transmitter unit the supervisor can be alarmed when an animal is ill and/or displays abnormal behaviour. On the rotatable upper part 7 there are further disposed disinfecting means 11 for disinfecting at least a part of the stable and/or at least a part of an animal. In the present embodiment the disinfecting means 11 comprise a sprayer 12 which is disposed on a telescopic carrier 13.

On the rotatable upper part 7 there are further disposed driving means 14 for driving animals. The driving means 14 are fitted to the upper side of the camera 9. The driving means 14 are connected to an electric shock device which is capable of emitting a pulse.

In the present embodiment the camera 9 is used to guide the unmanned vehicle through the stable and/or the meadow.

CLAIMS

1. An unmanned vehicle to be used in a stable (1), such as e.g. a cowshed, or in a meadow, characterized in that the unmanned vehicle (3) is provided with detection means (4) for determining the health and/or the behaviour of animals.

2. An unmanned vehicle as claimed in claim 1, characterized in that the detection means (4) comprise an animal identification system.

3. An unmanned vehicle as claimed in claim 2, characterized in that the animal identification system comprises a transmitter and a receiver.

4. An unmanned vehicle as claimed in claim 2, characterized in that the animal identification system comprises a radar (8) as well as reflectors reacting to the radar.

5. An unmanned vehicle as claimed in claim 2, characterized in that the detection means comprise a camera (9).

6. An unmanned vehicle as claimed in claim 5, characterized in that the camera (9) is constituted by an infrared camera.

7. An unmanned vehicle as claimed in any one of the preceding claims, characterized in that the detection means (4) are disposed on a telescopic carrier.

8. An unmanned vehicle as claimed in any one of the preceding claims, characterized in that the unmanned vehicle (3) is provided with driving means (14) for driving animals.

9. An unmanned vehicle as claimed in claim 8, characterized in that the driving means (14) comprise an electric shock device.

10. An unmanned vehicle as claimed in any one of the preceding claims, characterized in that the unmanned vehicle (3) comprises disinfecting means (11) for disinfecting at least a part of the stable (1) and/or a part of an animal.

11. An unmanned vehicle as claimed in claim 10, characterized in that the disinfecting means (11) are disposed on a telescopic carrier (13).

12. An unmanned vehicle as claimed in any one of the preceding claims, characterized in that the unmanned vehicle (3) is provided with a manure slide for removing manure which is lying on a floor.

13. An unmanned vehicle as claimed in any one of the preceding claims, characterized in that the unmanned vehicle (3) comprises alarm means for alarming a supervisor when an animal is ill or displays abnormal behaviour.

14. An unmanned vehicle as claimed in any one of the preceding claims, characterized in that the unmanned vehicle (3) is provided with navigation means for guiding the unmanned vehicle through the stable or the meadow.

15. An unmanned vehicle as claimed in any one of the preceding claims, characterized in that the unmanned vehicle (3) comprises a rotatable upper part (7) on which the detection means (4) are disposed.

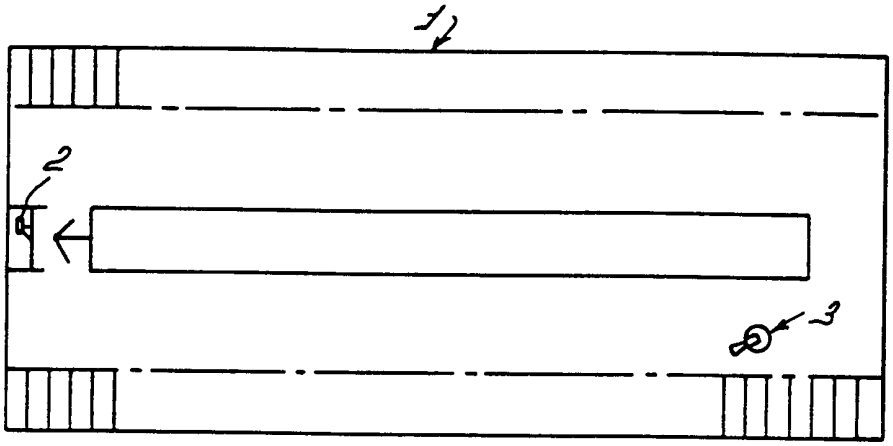


FIG. 1

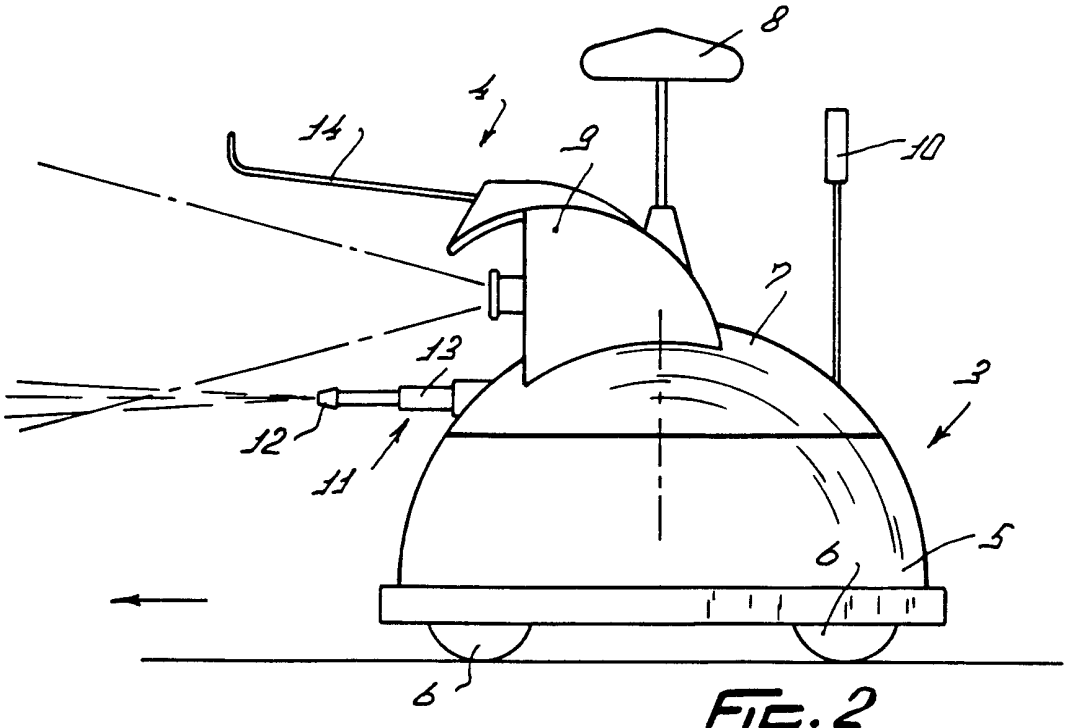


FIG. 2

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International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A01K29/00 A01K1/00

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 7 A01K B25J

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ, WPI Data

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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| Date of the actual completion of the international search | Date of mailing of the international search report |
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| 27 July 2000 | 04/08/2000 |

| Name and mailing address of the ISA | Authorized officer |
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| European Patent Office, P.B. 5818 Patentlaan 2<br>NL – 2280 HV Rijswijk<br>Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,<br>Fax: (+31–70) 340–3016 | von Arx, V. |

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