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(71) Applicant: **RTG Security AB**
37432 Karlshamn (SE)

(72) Inventors:
- **Holmström, Roger**
  37493 Karlsham (SE)
- **Abaji, George**
  37451 Asarum (SE)

(74) Representative: **Karlsson, Leif et al**
Ström & Gulliksson AB
P.O. Box 4188
203 13 Malmö (SE)

(54) Method and device avoiding theft of fuel

(57) A method at filling-up a vehicle with fuel at a filling station. The method comprises the step of: in response to an initiation of a filling-up (100) by a person, registering information (110) of the filling-up. The information comprises at least one image of something of the person initiating the filling-up and the vehicle. Further, the method comprises the step of storing (120) the registered information, and in response to payment (130) of the fuel deleting (140) said at least one image.

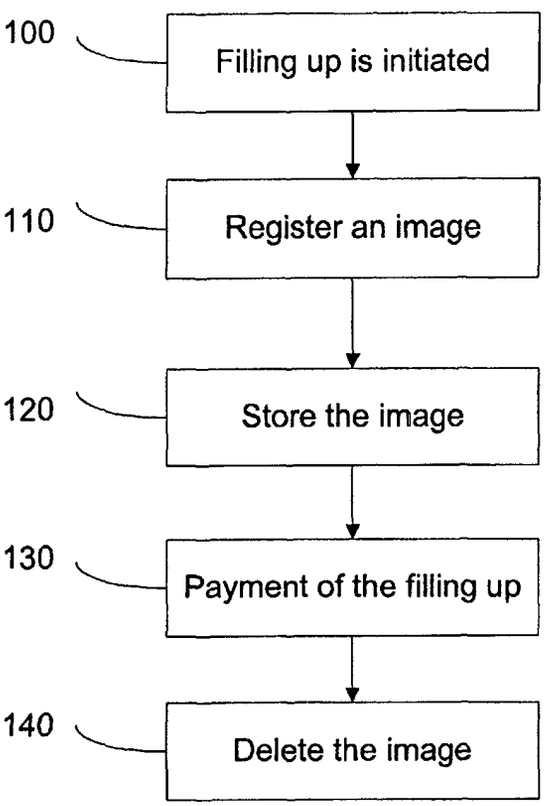

Fig. 4

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Description

Technical field

[0001] The present invention relates to a method at filling-up a vehicle with fuel at a filling station. Further, it also relates to a surveillance system for a filling station comprising a camera and a memory, a filling station comprising at least one pump unit, a camera and a memory, and a memory medium.

Prior art

[0002] Today, there are manned filling stations across the country. Filling stations do not only sell fuel, but also e.g. provisions. As a result the assistant at filling stations has got an increased workload, which moreover is varying at different points of time. This has increased the stress for the assistant, and it has become more difficult for the assistant to control the fuel pumps and the persons filling-up, so that payment for the filling-up is made. There is not enough time to note the car-number of cars being filled-up. Also, persons who have filled-up can buy other articles at the filling station, which means that it can take a while before payment of the filling-up is made, and as a result it gets even more difficult for the assistant to control that payment is made.

[0003] Today, large quantities of fuel is stolen without anyone guilty being caught. This is a large problem for the petroleum companies, since they loose large amounts of money.

[0004] One method of trying to solve the problem is to set up video cameras filming the vehicle and the person filling-up the vehicle. When it is detected that someone who has filled-up has left the filling station without paying, one can rewind and scan the videotape with the recorded crime. One problem is that it is necessary to have a special authorization to set up a camera in a public place today.

[0005] Another problem is that if it takes too long before the crime is detected a larger portion of the recorded videotape may have to be scanned, which can be time consuming.

Summary of the invention

[0006] Therefore, an object of the present invention is to provide a method at filling-up, wherein the problem as set forth above is entirely or partly avoided.

[0007] According to a first aspect of the present invention, this relates to a method at filling-up a vehicle with fuel at a filling station. The method is featured in that it comprises the steps of: in response to that a filling-up is initiated by a person, registering information regarding the filling-up comprising at least one image of something the person initiating the filling-up and the vehicle, storing the registered information, and in response to payment of the fuel, deleting said at least one image.

[0008] This method is advantageously used for surveillance of filling-up at a manned filling station when payment of filling-up is made afterwards.

[0009] A filling-up is initiated when fuel starts to be pumped out from the nozzle of the pump unit, which can occur when the handle is pressed. An image is registered when the filling-up is initiated. It is also possible to register several images.

[0010] There is advantageously sufficient information in the image for identifying the person who initiated the filling-up, and if payment is not made, thereby being able to find the guilty person. It may be sufficient to register the person filling-up or the vehicle that is filled-up. When the vehicle is registered, the license plate of the vehicle is advantageously included in the registration.

[0011] The information being registered can also include e.g. the current pump unit.

[0012] The registered information is temporarily stored and is deleted when the person has paid for the filling-up. During the time the information is stored, e.g., an assistant at the filling station can obtain and inspect the information.

[0013] An advantage of this is that if the assistant becomes unsure whether a person has slipped away, or not yet has managed to pay, he or she can watch the registered image and notice if the person still remains in the shop. The person may have moved his/her car from the pump unit for letting the next person forward, without the intention of leaving and not paying.

[0014] In one embodiment according to the invention, the registered information also includes the time of the filling-up. For example, the stroke of the clock can be registered. Also, the date of the filling-up can be registered. If payment of the filling-up is not made the exact time of when the filling-up occurred can be obtained, which i.a. can facilitate when it should be proved that the person of the image actually was at the filling station.

[0015] In another embodiment of the invention the information also comprises the amount of fuel being filled-up. An advantage of registering the amount of fuel being filled-up is that it is possible to extract the amount of stolen fuel when the person leaves without paying.

[0016] In one embodiment, the image comprises both the person initiating the filling-up and the vehicle being filled-up with fuel.

[0017] The vehicle, or the license plate that should be registered with the vehicle, can present information of the owner of the vehicle. However, the vehicle could e. g. be stolen or lent to another person, which results in that it is also a significant advantage of registering the person filling-up, because there is then no doubt about who carried out the filling-up. The vehicle and the person are advantageously registered in one image, because it requires less storage space. Alternatively, the vehicle and the person can be registered in different images.

[0018] In yet another embodiment according to the invention, the method comprises the step of emitting an alarm signal if the information is stored after a predeter-

mined period of time, since the registration of information, is exceeded.

[0019] A clock can be started when the filling-up is initiated or when the filling-up is completed and be set to emit an alarm to an assistant at the filling station to attract the assistant's attention to that payment for a certain filling-up has not been made within this period of time. It is possible that the person who carried out the filling-up still remains at the filling station and is buying other articles, but it is also possible that the person has left the filling station without paying the fuel.

[0020] In one embodiment according to the invention, the method comprises the step of displaying the registered information on a screen. The screen can provide registered information, e.g. for a number of pump units. An assistant at the filling station can supervise the filling-up at different pump units, all the time by means of the registered image and any additional information shown on the screen. As soon as a payment for the filling-up at a pump unit is made, at least the registered image is deleted, and the assistant can then observe on the screen that payment for the filling-up has been made. If suspicion of leaving from payment of a filling-up at a certain pump unit arises, the assistant can e.g. click on the image registered for that pump unit and the image can be enlarged. Also, the information can be forwarded to a printer, printing out the registered image together with any additional information.

[0021] According to a second aspect of the present invention, it relates to a surveillance system for a filling station comprising a camera, a memory, and a controller with at least one input, wherein the controller is arranged to control the camera in response to an initiated filling-up to register at least one image and store it in the memory, and in response to a payment signal on the input, carrying information that the filling-up is paid for, delete said at least one image. The memory can be a separate unit or a part of the camera. The memory is advantageously a part of the controller, because all the information of the filling-up then can be stored in this unit.

[0022] According to a third aspect of the invention, this at least one filling station comprises at least one pump unit, a camera and a memory, wherein the gas station further comprises a controller and that the pump unit is arranged to send an initiation signal to the controller in response to a filling-up being initiated, wherein the controller is arranged to receive the initiation signal and as a response to this send a registration signal to the camera registering at least one image, which is stored in a memory, and in response to a payment signal with information of payment of the filling-up, delete said at least one image.

[0023] According to a fourth aspect of the invention, it relates to a memory medium, which can be read by a computer, and on which a computer program is stored, which is intended to be used for controlling a surveillance system at a filling station, wherein the program comprises instructions to in response to an initiation signal of an initiation of a filling-up, send at least one registration signal with information of a registration and storing of an image, and in response to a payment signal on the input, with information of that payment of the filling-up is made, send a delete signal with information of a deletion of said at least one image.

[0024] According to a fifth aspect of the invention, it relates to a memory medium readable by a computer, and on which is stored a computer program intended to be used by a surveillance system at a filling station, wherein the program comprises instructions for the method according to any of the claims 1-6.

[0025] The advantages with the surveillance system, the gas station, and the memory medium are obvious from the discussion of the method.

Brief description of the drawings

[0026] The invention will be described in more detail in the following with reference to the attached drawings.

[0027] Fig. 1 schematically shows a block diagram of the surveillance system according to the invention.

[0028] Fig. 2 schematically shows a registered image.

[0029] Fig. 3 is a flow chart illustrating an embodiment of the method according to the invention.

[0030] Fig. 4 is a flow chart illustrating an embodiment of the method according to the invention.

Detailed description of a preferred embodiment

[0031] A preferred embodiment will now be described with reference to the Figs. 1-3. Fig. 1 schematically shows a block diagram of a surveillance system for a filling station according to a preferred embodiment of the invention. The surveillance system comprises a pump unit 1, a camera 2, and a controller 3 comprising a memory 4, and a time means 5. The controller 3 can transmit and receive signals from both the pump unit 1 and the camera 2.

[0032] Fig. 2 shows an image registered by the camera 2. In the image a person 11 who is to fill up and the person's car 12, which will be filled-up with fuel from the pump unit 1, is present. When a person 11 with a car 12 arrives at the filling station for filling-up, the person 11 drives the car 12 to a pump unit 1 of the filling station. The filling-up is initiated 200 in that the person 11 presses the handle of the pump unit 1 and the fuel is pumped out. In response to an initiation of the filling-up being made, the pump unit 1 transmits 210 an initiating signal 6 to the controller 3 of that the initiation of the filling-up is made. In response to the initiation signal 6 the controller 3 transmits 220 a registration signal 7 to the camera 2 for a registration of an image. If the filling station has several pump units 1, every pump unit 1 can have a camera 2 connected thereto and the registration signal 7 is then passed to the camera 2, taking images over the area, at the pump unit 1, from which the initiating signal 6 was sent, which will be registered.

[0033] The camera 2 is registering 230 an image, shown in Fig. 2, which is sent 240 as an image signal 8 to the memory 4 of the controller 3 to be stored 250. The image comprises the car 12, the registration number 13 of the car and the person 11 carrying out the filling-up.

[0034] The stroke of the clock of the initiated filling-up is registered simultaneously as the controller 3 receives the initiation signal 6. This information is stored together with the registered image. Moreover, the controller 3 starts the count-down with the timing means 5 from, e. g. 10 minutes. If a longer time than 10 minutes passes before a payment of the filling-up has been made 260 an alarm 300 will alert the assistant at the filling station of this. When the alarm is sounded the assistant can print out 310 the registered information of the filling-up particular to the alarm. In the image, the assistant can notice who carried out the filling-up and the car 13 being filled-up and check if the person 11 and the car 12 remains in the area of the filling station. If that is not the case, the assistant can sound the alarm when a steeling of gas has occurred by e.g. calling the police. In that case, the assistant can give the registration number 13 of the car 12 that has been filled-up. A reset signal 10 can be sent to the pump unit that it can be used again 320.

[0035] When the person 11 filling-up is returning the handle to the pump unit 1, a filling-up signal 9 about how much fuel the person 11 has filled-up can be sent to the controller 3, which stores this information together with any other information of this filling-up in the memory 4. The person who has filled-up is then paying 270 for the filling-up at the cash desk and a payment signal is sent to the controller 3. Responsive to the payment signal the controller 3 sends a delete signal to the memory 4 for a deletion 208 of all registered information of the filling-up. It is also possible to only delete the image, while the information of the amount of gas being filled-up is stored for usage in any type of statistics. Also, a reset signal 10 is sent to the pump unit 1 resetting the counter of the amount of pumped fuel, and the pump unit 1 can be reused 290.

[0036] Although a specific preferred embodiment of the invention has been described above it is obvious for the man skilled in the art that many alternatives, modifications and variations are possible to achieve from the description as set forth above. It is e.g. possible that a new person can use the pump unit 1 before the preceding person has paid to avoid a queue. The information is temporarily stored, and as soon as the person has paid for the filling-up, the information of this is deleted.

[0037] Naturally, all the steps described do not have to be carried out in a method according to the invention. In Fig. 3, a flow chart of a simplified method according to the invention is shown. A person with a car is connecting the nozzle of the pump unit to the fuel tank of the car. A filling-up is initiated 100 by the person pulling the handle of the pump unit 1 and fuel starts to be pumped out of the nozzle. An image, see Fig. 2, of the person 11 and the car 12 is registered 110. The image is stored 120 in a memory 4. When the person 11 heads towards the cash desk and pays 130 for the filling-up, the image is deleted 140 from the memory 4.

[0038] It is possible to install the surveillance system in already existing filling stations.

[0039] According to another alternative embodiment, the registered image is stored in a memory of the camera 2. When the filling-up is paid for, a delete signal is sent from the controller 3 to the camera 2 comprising information for the camera 2 to delete the image. However, if the filling-up is not paid for, the controller 3 can send a signal to the camera 2 comprising information of a transmitting of the registered image to the controller 3, for further processing.

Claims

1. A method at filling-up a vehicle with fuel at a filling station, **characterized in that** said method comprises the steps of:

   in response to a filling-up (100, 200) being initiated by a person, register information (110, 230) of the filling-up, including at least one image of any of the person initiating the filling-up and the vehicle,
   storing (120, 250) the registered information, and
   in response to payment (130, 270) of the fuel, deleting (140, 280) said at least one image.

2. A method according to claim 1, wherein the registered information comprises the time of the filling-up.

3. A method according to any of the preceding claims, wherein the information comprises the amount of fuel being filled-up.

4. A method according to any of the preceding claims, wherein the image comprises both the person initiating the filling-up and the vehicle being filled-up with fuel.

5. A method according to any of the preceding claims, further comprising the step of emitting an alarm signal (300) if the information is stored after a predetermined period of time, since the registration of the information, is exceeded.

6. A method according to any of the preceding claims, further comprising the step of presenting the registered information on a screen.

7. A surveillance system for a filling station comprising a camera (2) and a memory (4), **characterized in**

that it also comprises a controller (3) with at least one input, wherein the controller (3) is arranged to in response to an initiated filling-up, control the camera (2) and to register at least one image and store it in the memory (4), and in response to a payment signal on the input, with information of the filling being paid, delete said at least one image.

8. A surveillance system according to claim 7, which also comprises a timing means (5), wherein the controller (3) is further arranged to in response of an initiated filling-up, register the time of the filling-up with the timing means (5).

9. A surveillance system according to any of the claims 7-8, wherein the controller (3) is arranged to register the amount of fuel being filled-up.

10. A surveillance system according to any of the claims 7-9, wherein the controller (3) is arranged to emit an alarm signal if said at least one image is still stored after a predetermined period of time is exceeded.

11. A filling station comprising at least one pump unit (1), a camera (2) and a memory (4), **characterized in that** it also comprises a controller (3) and that the pump unit (1) is arranged to transmit an initiation signal (6) to the controller in response to an initiated filling-up, wherein the controller (3) is arranged to receive the initiation signal (6), and in response to this transmit a registration signal (7) to the camera (2) to register at least one image of any of the person initiating the filling- up and the vehicle, which image is stored in a memory (4), and in response to a payment signal with information of a payment of filling-up is made, delete said at least one image.

12. A memory medium, which can be read by a computer, and on which a computer program is stored which is adapted to be used for controlling a surveillance system at a gas station, **characterized in that** the program comprises instructions of as a response to an initiation signal (6) of a filling-up being initiated, send at lest one registration signal (7) with information of a registration and storing of an image, and in response to a payment signal on the input, with information about payment of the filling-up is made, transmit a delete signal with information of a deletion of said at least one image.

13. A memory medium, which can be read by a computer, and on which a computer program is stored which is adapted to be used for controlling a surveillance system at a filling station, **characterized in that** the program comprises instructions for the method according to any of the claims 1-6.

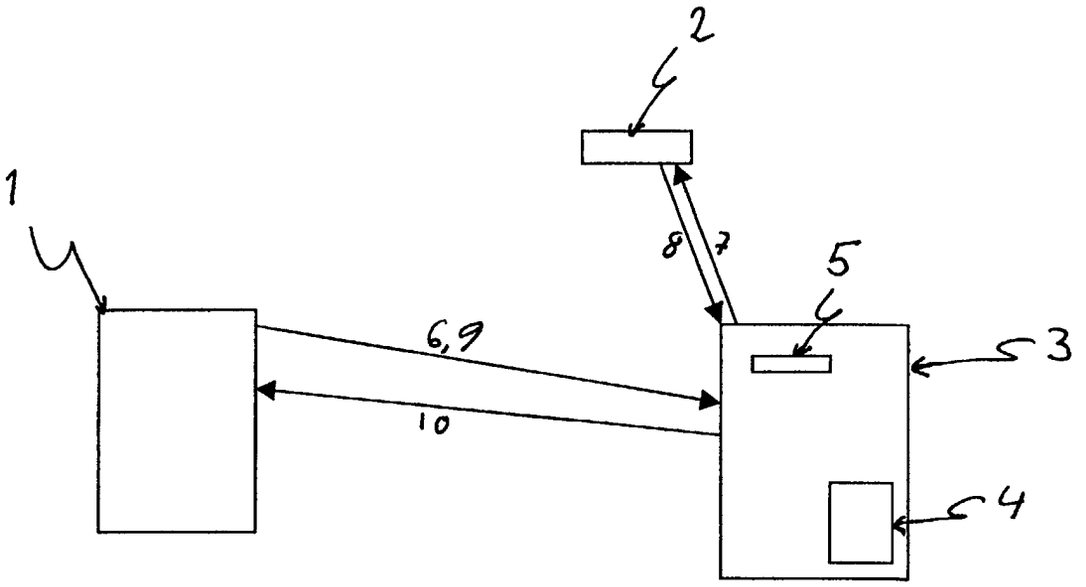

Fig 1

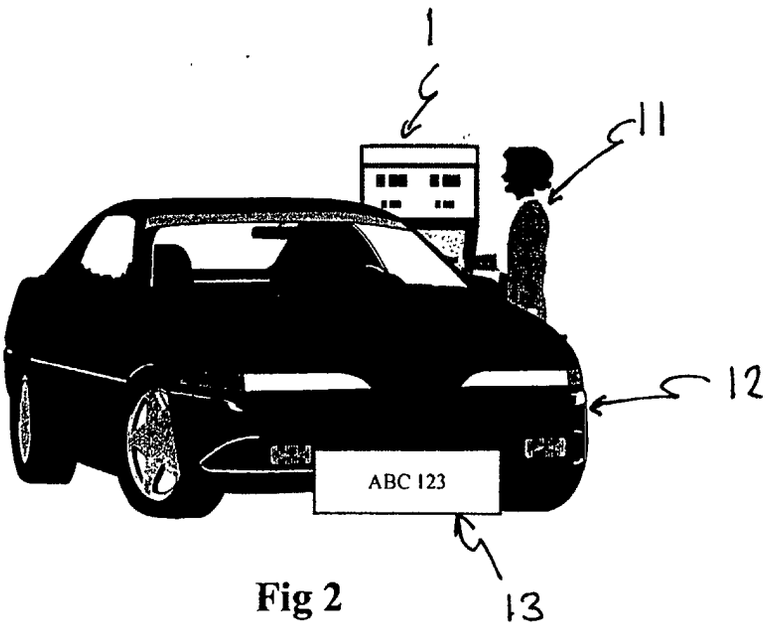

Fig 2

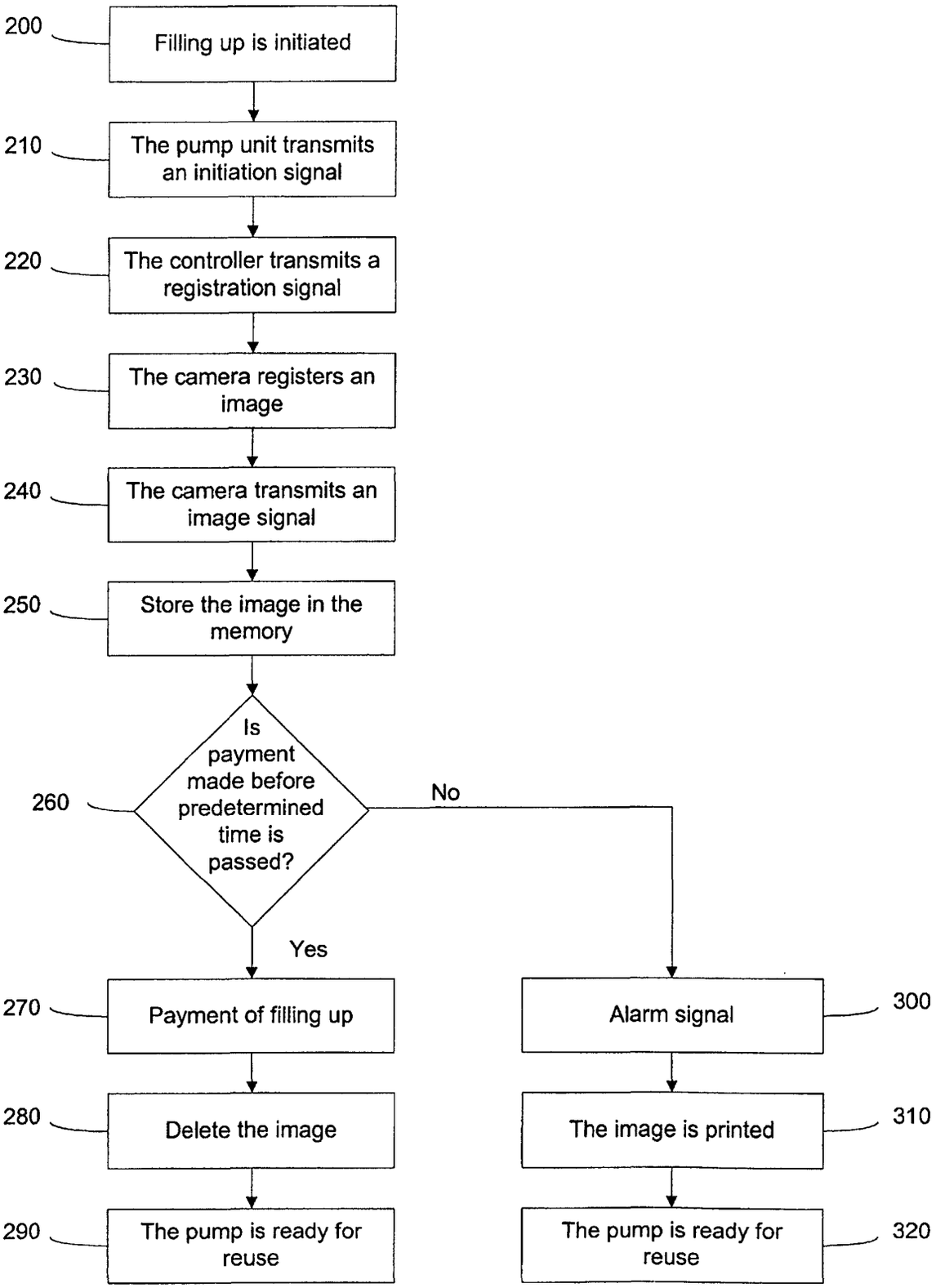
200
Filling up is initiated
210
The pump unit transmits an initiation signal
220
The controller transmits a registration signal
230
The camera registers an image
240
The camera transmits an image signal
250
Store the image in the memory
260
Is payment made before predetermined time is passed?
No
Yes
270
Payment of filling up
280
Delete the image
290
The pump is ready for reuse
300
Alarm signal
310
The image is printed
320
The pump is ready for reuse

Fig. 3

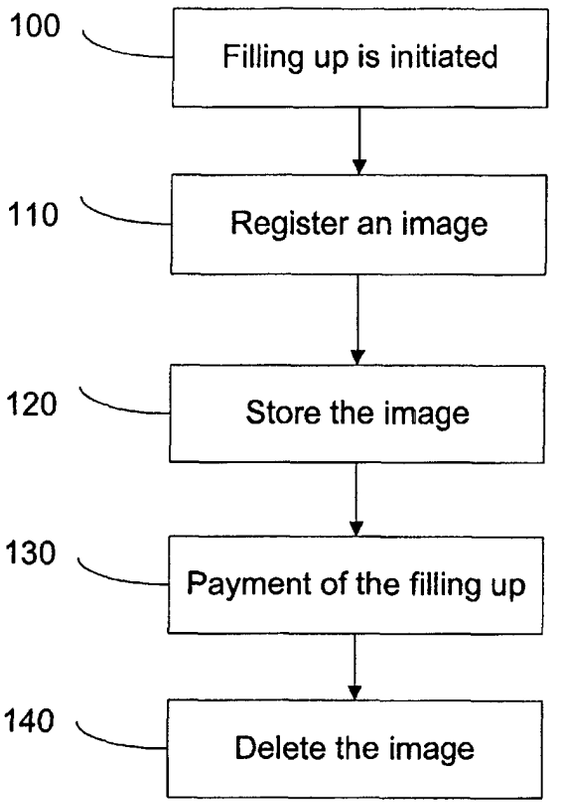
100
Filling up is initiated
110
Register an image
120
Store the image
130
Payment of the filling up
140
Delete the image

Fig. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 12 1991

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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A	DE 91 14 147 U (HANZ,K.H.) 21 May 1992 (1992-05-21)		
A	WO 99 16700 A (GILBARCO LTD) 8 April 1999 (1999-04-08)		

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B67D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	6 February 2002	Müller, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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06-02-2002

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