(19) DANMARK

(10) **DK/EP 3670007 T3**

Patent- og Varemærkestyrelsen

(12) Oversættelse af europæisk patentskrift

(51) Int.Cl.: ***B 07 C 5/00 (2006.01)*** ***B 07 C 3/00 (2006.01)*** ***B 65 G 43/00 (2006.01)***

(45) Oversættelsen bekendtgjort den: **2023-03-27**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2022-12-21**

(86) Europæisk ansøgning nr.: **18215500.2**

(86) Europæisk indleveringsdag: **2018-12-21**

(87) Den europæiske ansøgnings publiceringsdag: **2020-06-24**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

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(54) Benævnelse: **Fremgangsmåde til bestemmelse af en tilstand af et sorteringsanlæg, funktionsenhed og sorteringsanlæg**

(56) Fremdragne publikationer:
EP-A1- 3 153 939
EP-A1- 3 287 400
WO-A1-2013/112561

Description

Method for determining a state of a sorting installation, functional unit and sorting installation

The invention relates to a method for ascertaining a status of a sorting installation.

Sorting installations are used in many fields. For example, sorting installations are used to sort (mail) items, i.e. letters, parcels and/or packages. Sorting installations are further used to sort items of luggage. In the field of logistics, sorting installations are also used to sort goods and workpieces.

In order to ascertain the status of a sorting installation, the sorting installation is generally examined by a person on a visual and, if necessary, acoustic basis. For example, the person can walk along the sorting installation, record optical and acoustic information and thus assess the status of the sorting installation.

In particular, the person can recognise existing and/or impending fault states in good time. In this manner, fault states can be rectified in good time. This makes it possible to keep downtimes of the sorting installation as low as possible.

Walking along the sorting installation requires a great deal of time. In order to reduce the time required, it is possible to position sensors, for example monitoring cameras and/or microphones, at a plurality of positions in the room. The cameras are able to record images of the sorting installation

at regular intervals. Microphones can record noises. On the basis of the images and/or the noises, a person can assess the status of the sorting installation.

Manual examination, however, depends greatly upon the experience of the person carrying it out, and is susceptible to errors.

It is also possible to compare the recorded images and/or noises with setpoint values on an automated basis.

WO-A-2013/112561 discloses the ascertaining of the status of container stations of a sorting installation, wherein each container point is assigned a stationary sensor, meaning that a measurement can only take place at the container stations themselves. The data transmission takes place by way of functional units equipped with transceiver units as well as a plurality of stationary communication units arranged along the transport path. The data transmission takes place via infrared, and therefore does not require cabling, but instead a line of sight.

EP-A-3 153 939 discloses a sorting installation with sensors comprised by decentral, stationary functional units, which sensors are therefore only capable of monitoring a certain part of the installation.

EP-A-3287499 discloses a delivery vehicle with a detection unit, comprising sensors for recognising the surrounding area, with the aim of enabling a safe delivery, in which collisions are avoided and the delivery vehicle reliably finds a delivery box. The sensors of the detection unit enable a safe delivery by recognising obstacles (vehicles, animals, traffic lights,

...), wherein the majority of these obstacles will change the next time their position is passed, and the delivery vehicle will also generally travel along different paths. These obstacles are therefore not comparable with anomalies in an installation.

If sensors are positioned in the room, however, there is the risk that the sensors are covered, other noise sources drown out the noises of the sorting installation, or the recorded signals otherwise experience interference. Additionally, a plurality of sensors have to be positioned in the room for each sensor type, with the signals thereof all having to be evaluated. This represents a comparably large amount of effort.

The object of the invention is to provide an alternative, in particular an improved, method for ascertaining a status of a sorting installation.

The object is achieved by a method for ascertaining a status of a sorting installation according to claim 1, a functional unit according to claim 11, as well as a sorting installation according to claim 12, wherein in particular a functional unit is moved over a plurality of transport paths of the sorting installation and status information of the sorting installation is ascertained using at least one sensor of the functional unit. Anomalies in the status information are ascertained by means of a data processing unit of the functional unit. The anomalies are transferred from the functional unit to an evaluation unit. According to the invention, a status of the sorting installation is ascertained on the basis of the anomalies.

In this manner, the status of the sorting installation can be ascertained automatically, to the greatest possible extent. In particular, the status of the sorting installation can be ascertained in a time-efficient manner. Furthermore, it is possible to reduce sources of faults while ascertaining the status of the sorting installation.

As the functional unit is moved over the plurality of transport paths of the sorting installation, it is possible to dispense with positioning a plurality of sensors of one sensor type multiple times, as would be necessary when positioning them in the room. In this manner, it is possible to save costs. Furthermore, the amount of data to be evaluated can accordingly be lower. In this manner, the method is particularly economical.

For example, a status of the sorting installation can be a normal state and/or a fault state. An ascertained fault state, for example, may have information regarding a kind of fault, a fault location and/or a fault time.

Expediently, the sorting installation is a sorting installation for sorting piece goods. Preferably, the sorting installation transports the piece goods to be sorted to a plurality of/different destinations. This means that the sorting installation is preferably configured for transporting piece goods to different destinations. The sorting of the piece goods can take place in this manner.

In particular, the sorting installation can be a sorting installation for sorting items of luggage and/or mail items. Mails items may be, for example, parcels, packages and/or letters. For example, the sorting installation can be a

luggage sorting installation, a package sorting installation, or the like. Furthermore, the sorting installation can also be a sorting installation for workpieces and/or goods.

Expediently, the functional unit is a unit which is moved over a plurality of transport paths of the sorting installation. The functional unit can have the dimensions of a standard item of piece goods, for example. Furthermore, the functional unit can have a kind of tray, in particular a luggage tray. For example, the tray is able to carry the data processing unit of the functional unit, the at least one sensor and, if necessary, further elements of the functional unit in its recess and/or at other suitable positions.

At least when the functional unit is moved over the transport paths of the sorting installation, the functional unit preferably ascertains the status information.

It is expedient if the functional unit has a data processing unit, by means of which anomalies in the status information are ascertained.

For example, the anomalies can be ascertained using predefined rules. For example, the anomalies can be ascertained by means of a comparison of the status data with a reference.

It is advantageous if at least the anomalies which can be referred to as anomalies of the status information are linked with localisation information.

An item of localisation information linked with an anomaly preferably indicates at which location within the sorting installation the respective anomaly was ascertained.

In this manner, a fault location can be ascertained.

The localisation information can be ascertained by the functional unit. Furthermore, the localisation information can be ascertained by an installation controller of the sorting installation. Furthermore, the localisation information can be forwarded to the functional unit and/or to the evaluation unit.

The localisation information can be ascertained using a positioning system, in particular GPS. Furthermore, the localisation information can be ascertained using control data of the installation controller. In particular, data from read stations of the sorting installation, which read stations are preferably positioned on the transport paths, can be used to ascertain the localisation information - possibly factoring in time stamps.

The localisation information can be linked with the anomalies by means of the data processing unit of the functional unit. In particular, the data processing unit of the functional unit can link the localisation information with the anomalies. For example, the anomalies in the status information can be ascertained by means of the data processing unit and the localisation information can then be linked with the anomalies by means of the data processing unit.

Furthermore, the localisation information can be linked with the status information by means of the data processing unit of the functional unit. In particular, the data processing unit of the functional unit can link the localisation information with the status information. For example, the localisation

information can then be linked with the status information by means of the data processing unit and the anomalies in the status information can then be ascertained by means of the data processing unit. In this case, the ascertained anomalies are expediently already linked with the localisation information when they are ascertained.

Furthermore, the localisation information can be linked with the anomalies by means of the evaluation unit, for example using timestamps. In particular, the evaluation unit can link the localisation information with the anomalies. For example, the anomalies can be transmitted from the functional unit to the evaluation unit and the localisation information can then be linked with the anomalies by means of the evaluation unit.

It is advantageous if the functional unit is moved over the plurality of transport paths, in particular over all transport paths of the sorting installation, at least once.

It is particularly preferred if the functional unit is regularly moved over the plurality of transport paths of the sorting installation. For example, the functional unit can be moved over the plurality of transport paths of the sorting installation weekly, daily and/or multiple times a day. Furthermore, the transport paths can be moved over by the functional unit constantly.

In this manner, a long-term analysis of the status data and/or the anomalies can be enabled.

Preferably, the functional unit moves again over at least one of the transport paths, in which at least one anomaly has occurred. In particular, the functional unit moves again over

the transport paths, in which anomalies have occurred.

In this manner, regions of the sorting installation, in which anomalies occur, can be particularly monitored.

When moving again over the at least one transport path, in which at least one anomaly has occurred, it is advantageous if the functional unit moves over said transport path in a targeted manner. In particular, when moving again over the at least one transport path, in which at least one anomaly has occurred, it is advantageous if the functional unit does not move over all transport paths of the sorting installation.

In this manner, it is possible to reduce the time required to move over and/or the distance to be moved over.

Expediently, in a first pass of the method, the plurality of transport paths of the sorting installation are moved over. It is further preferred if, in a second pass of the method, the transport paths to be moved over are ascertained on the basis of the anomalies ascertained in the first pass.

In this manner, regions of the sorting installation, in which anomalies occur, can be particularly monitored. In this manner, it is further possible to reduce the time needed to move over and/or the distance to be moved over.

The status information of the sorting installation can comprise at least one of the following information types: visual information of at least one section of one of the transport paths, acoustic information of at least one section of one of the transport paths, acceleration information of the functional unit, speed information of the functional unit,

vibration and/or position change information and/or temperature information. The temperature information preferably comprises information regarding a temperature of at least one element of the sorting installation, for example a drive unit of the sorting installation.

It is advantageous if the sorting installation comprises all the information types mentioned.

This means that the functional unit can have at least one of the following sensors: camera, microphone, acceleration sensor, speed sensor, gyro-sensor and/or a temperature sensor.

Preferably, the anomalies are transmitted from the functional unit to the evaluation unit using a wireless data connection. The wireless data connection, for example, can be a connection using WLAN, Bluetooth, Near Field Communication (NFC) or the like.

The evaluation unit is preferably an evaluation unit of the sorting installation.

The evaluation unit can comprise at least one computer. Furthermore, the evaluation unit can be a computer network, in particular a cloud.

An evaluation unit designed as a computer network is also able to evaluate data, in particular status information, of other sorting installations. In this manner, the evaluation of the data can be improved. In particular, data mining methods can be applied.

On the basis of the anomalies, a status of the sorting

installation can be ascertained, in particular by means of the evaluation unit.

It is advantageous if the evaluation unit has a pattern recognition algorithm. The pattern recognition algorithm is able to recognise at least one pattern within the anomalies. On the basis of the recognised pattern, it is possible to infer a status of the sorting installation.

For example, the evaluation unit comprises a self-learning system, which has the pattern recognition algorithm. It is advantageous if the pattern recognition algorithm changes over time, in particular is post-trained.

Using the pattern recognition algorithm, it is possible to improve the ascertaining of the anomalies by means of the data processing unit of the functional unit.

In particular, on the basis of the pattern recognition algorithm, it is possible to ascertain rules, according to which anomalies can be ascertained in the status data. These rules can be transmitted to the data processing unit of the functional unit. In this manner, the ascertaining of anomalies in the functional unit can be improved.

Furthermore, the invention is directed towards a functional unit, which can be moved over a plurality of transport paths of a sorting installation.

The functional unit has at least one sensor for ascertaining status information of the sorting installation. According to the invention, the functional unit comprises a data processing unit and a transmission unit.

According to the invention, the data processing unit is configured to ascertain anomalies in the status information of the sorting installation. Furthermore, the transmission unit is configured to transmit the anomalies from the functional unit to an evaluation unit. It is possible to ascertain a status of the sorting installation on the basis of the anomalies.

The functional unit according to the invention can be the functional unit previously mentioned in connection with the method. Consequently, the elements of the functional unit mentioned in the following can be the elements previously mentioned in connection with the method.

The transmission unit is able to transmit anomalies from the functional unit to the evaluation unit at least once, in particular multiple times, for example regularly. The transmission can take place regardless of or depending upon a position of the functional unit in the sorting installation.

The functional unit can have a camera as sensor. Furthermore, the functional unit can have a microphone as sensor. Furthermore, the functional unit can have an acceleration sensor as sensor. Additionally, the functional unit can have a speed sensor as sensor. Furthermore, the functional unit can have a gyro-sensor as sensor. Furthermore, the functional unit can have a temperature sensor as sensor. Other sensors for ascertaining status information of the sorting installation are also possible.

The invention is also targeted towards a sorting installation with a plurality of transport paths and with the previously

mentioned functional unit which is able to travel over the plurality of transport paths of the sorting installation. It is further preferred if the sorting installation has an evaluation unit. Expediently, the evaluation unit is configured to ascertain a status of the sorting installation on the basis of the anomalies.

The sorting installation according to the invention can be the sorting installation previously mentioned in connection with the method.

Preferably, the sorting installation comprises a data exchange zone. The data exchange zone preferably can be reached by the functional unit. In particular, the data exchange zone can be reached by the functional unit via the transport paths.

In this manner, a local provision of a data connection, namely in the data exchange zone, is sufficient. Furthermore, in this manner it is possible to dispense with providing a data connection on the transport paths themselves.

Expediently, the functional unit can be connected with the evaluation unit in the data exchange zone via a data connection. The data connection is preferably a wireless data connection. For example, the wireless data connection can be a connection using WLAN, Bluetooth, Near Field Communication (NFC) or the like.

Via this data connection, the anomalies of the status information can be transmitted from the functional unit to the evaluation unit. Furthermore, via the data connection, updates can be installed from the evaluation unit to the functional unit, in particular to the data processing unit of the

functional unit.

In this manner, it is possible to dispense with manually removing the functional unit for the data exchange.

Furthermore, it is preferred if the sorting installation comprises a charging zone. The charging zone can preferably be reached by the functional unit via the transport paths.

Expediently, the charging zone is configured for charging a rechargeable battery of the functional unit. For example, the rechargeable battery of the functional unit can be able to be inductively charged in the charging zone.

In this manner, it is possible to dispense with manually removing the functional unit to charge the rechargeable battery.

In a preferred embodiment of the invention, the charging zone coincides with the data exchange zone from a spatial perspective. In particular, the charging zone can coincide with the data exchange zone from a spatial perspective, to form a data exchange and charging zone.

In this manner, it is possible for data exchange and charging of the rechargeable battery to take place simultaneously. In this manner, a particularly time-efficient procedure is made possible.

The description presented thus far of advantageous embodiments of the invention contains numerous features which are repeated in the individual subclaims, with several combined in some cases. However, these features can expediently also be

considered individually and combined to form sensible further combinations. In particular, these features can be combined individually in each case and in any suitable combination with the method according to the invention, the functional unit according to the invention and the sorting installation according to the invention. Thus, method features are also to be considered as formulated physically, as characteristics of the corresponding device unit, and vice versa.

Even if individual terms are used in the singular or in association with a quantifier in the description or in the claims, the scope of the invention is not to be restricted to the singular or the respective quantifier for these terms.

The above-described characteristics, features and advantages of this invention, as well as the manner in which these are achieved, will become clearer and more readily understandable in conjunction with the following description of the exemplary embodiments, which are explained in more detail in conjunction with the drawings. The exemplary embodiments serve to explain the invention and do not restrict the invention to the combination of features indicated therein, including in relation to functional features.

In the drawings:

FIG 1 shows a sorting installation, and

FIG 2 shows the functional unit of the sorting installation from FIG 1.

FIG 1 schematically shows a section of a sorting installation 2. In this example, the sorting installation 2 is embodied as

a luggage sorting installation.

The sorting installation 2 has a plurality of transport paths 4. The transport paths 4 are subdivided into a plurality of transport zones 6. The transport paths 4 of different transport zones 6 are interconnected via diverters 8 of the sorting installation 2. The transport paths have transport directions 10, which are represented by arrows in FIG 1.

Additionally, the sorting installation 2 has a data exchange and charging zone 12. The data exchange and charging zone 12 can be reached via the transport paths 4. The data exchange and charging zone 12 is connected to the transport paths 4 of the transport zones 6 via at least one diverter 8 of the sorting installation 2. In the data exchange and charging zone 12, a data exchange zone coincides with a charging zone from a spatial perspective.

Furthermore, the sorting installation 2 has a plurality of read stations 14. The read stations 14 are arranged, for example, at the diverters 8 of the sorting installation 2. In particular, the read stations 14 are in each case arranged in front of the diverters 8, when viewed in the transport direction 10. The read stations 14 are configured to recognise an identification mark 16 (cf. FIG 2). An identification mark 16 can be a barcode, a QR code, an RFID transponder or the like, for example. Preferably, each read station 14 is in each case assigned to one of the diverters 8, in particular to the diverter 8 arranged as following when viewed in the transport direction 10.

Furthermore, the sorting installation 2 comprises an installation controller 18. By means of the installation

controller 18, each identification mark 16 can be assigned a route via the transport paths 4 in each case.

It is possible for elements of the sorting installation 2 to be controlled using the installation controller 18. For example, the diverters 8 can be controlled using the installation controller 18. Furthermore, drives of the sorting installation 2 can be controlled using the installation controller 18. Furthermore, light barriers and/or the read stations 14 of the sorting installation 2 can be read out using the installation controller 18.

Expediently, there is a data connection 19 in each case between the installation controller 18 and the elements of the sorting installation 2 controlled by means of the installation controller 18. For the sake of clarity, by way of example only a single one of the data connections 19 is drawn in FIG 1 between the installation controller 18 and one of the transport paths 4. For example, there are data connections 19 in each case between the installation controller 18 and the diverters 8 and/or the read stations 14.

Additionally, the sorting installation 2 has a plurality of luggage trays 20 for accommodating and transporting piece goods, in particular luggage. The luggage trays 20 can be moved over the plurality of transport paths 4 of the sorting installation 2. For example, the luggage trays 20 can be moved by means of transport bands. Other means for passively moving the luggage trays 20 are also possible. In principle, means for actively moving the luggage trays 20 are also possible.

The luggage trays 20 and/or the piece goods to be transported by means of the luggage trays 20 have identification marks 16.

Furthermore, the sorting installation 2 has a functional unit 22 which - in a similar manner to the luggage tray 20 - can be moved over the plurality of transport paths 4 of the sorting installation 2. The functional unit 22 can additionally move in the data exchange and charging zone 12.

Furthermore, the sorting installation has an evaluation unit 24. The evaluation unit can be a computer or a computer network, in particular a cloud.

The installation controller 18 can be connected to the evaluation unit 24 via a data connection 25.

Furthermore, the functional unit 22 can be connected to the evaluation unit 24 via a data connection 24, which in particular is wireless.

In the data exchange and charging zone 12, data can be transmitted between the functional unit 22 and the evaluation unit 24 using the latter data connection 26.

In this example, the functional unit 22 has the same shape and the same dimensions as a luggage tray 20. However, the functional unit 22 has additional features (cf. FIG 2). Generally, the functional unit 22 is not used for transporting piece goods.

The functional unit 22 also has an identification mark 16.

A route over the transport paths 4 can be ascertained on the basis of an identification mark 16 recognised by the read stations 14. Furthermore, on the basis of the recognised

identification mark 16, a respective diverter 8 can be set accordingly.

FIG 2 schematically shows the functional unit 22 from FIG 1.

The functional unit 22 has a plurality of sensors 28 for ascertaining status information of the sorting installation 2. In particular, the sensors 28 are configured for ascertaining status information of the sorting installation 2.

The sensors 28 are: at least one camera, a microphone, an acceleration sensor, a gyro-sensor and a temperature sensor. The temperature sensor can be an infrared sensor, for example. Further sensors 28 can be added and/or individual sensors 28 can be omitted.

Additionally, the functional unit 22 has a data processing unit 30, which is configured to ascertain anomalies in the status information of the sorting installation 2.

The data processing unit 30 is connected to the sensors 28 via a data connection 34 - which is wired in this case - in order to pick up the status data ascertained by means of the sensors 28.

Furthermore, the functional unit 22 has a transmission unit 32, which is configured to transmit the anomalies from the functional unit 22 to the evaluation unit 24 shown in FIG 1.

The data processing unit 30 is connected to the transmission unit 32 via a data connection 34 - which is wired in this case - in order to be able to forward the anomalies to the transmission unit 32.

The evaluation unit 24 (see FIG 1) of the sorting installation 2 is configured to ascertain a status of the sorting installation 2 on the basis of the anomalies.

The functional unit 22 further has a battery 36, i.e. a rechargeable battery 36. The rechargeable battery 36 can supply the sensors 28, the data processing unit 30 and the transmission unit 32 with electrical energy (not explicitly shown).

To ascertain a status of the sorting installation 2 from FIG 1, the functional unit 22 is moved over a plurality of transport paths 4 of the sorting installation 2 (cf. FIG 1).

Status information of the sorting installation 2 is ascertained using the sensors 28 of the functional unit 22.

In this example, the following status information is ascertained: visual information of at least one section of one of the transport paths 4 (i.e. preferably at least one image of at least one section of one of the transport paths 4), acoustic information of at least one section of one of the transport paths 4 (i.e. preferably noises and/or at least one frequency spectrum of at least one section of one of the transport paths 4), acceleration information of the functional unit 22, vibration and/or position change information, temperature information of an element, in particular a drive, of the sorting installation 2.

The status information is linked with a time or a timestamp and is stored within the functional unit 22. In particular, the functional unit 22 can have a timer, which generates the

timestamp (not shown).

Anomalies in the status information are ascertained by means of the data processing unit 30 of the functional unit 22.

When the functional unit 22 has moved over the plurality of transport paths 4, the functional unit 22 can be moved into the data exchange and charging zone 12. Alternatively, the functional unit 22 can be moved into the data exchange and charging zone 12 when the rechargeable battery 36 assumes a critical state.

In the data exchange and charging zone 12, a data connection 26 is established between the functional unit 22 and the evaluation unit 24. Preferably, the data connection 26 between the functional unit 22 and the evaluation unit 24 is a wireless data connection 26.

The anomalies are transmitted by means of the transmission unit 32 from the functional unit 22, via the data connection 26, to the evaluation unit 24.

At the same time, the rechargeable battery 36 can be charged.

The anomalies transmitted to the evaluation unit 24 are linked with localisation information. In particular, the localisation information is linked with the anomalies by means of the evaluation unit 24, for example using timestamps.

Information of the installation controller 18 is also factored in, in order to ascertain the localisation information. The information of the installation controller 18 is/was transmitted from the installation controller 18, via the data

connection 25, to the evaluation unit 24 (cf. FIG 1). For example, it is possible to also factor in when the functional unit 22 was detected by a certain read station 14, when the installation controller has set a diverter 8 accordingly, or the like. Furthermore, for example, it is also possible to factor in the drive speeds and/or stopping times on the transport paths 4, in order to ascertain the localisation information.

A status of the sorting installation 2 is ascertained by means of the evaluation unit 24, on the basis of the anomalies.

Preferably, the transport paths 4 of the sorting installation 2 are moved over multiple times.

The evaluation unit 24 has a pattern recognition algorithm, which recognises at least one pattern within the anomalies. A status of the sorting installation 2 is inferred on the basis of the recognised pattern.

Using the pattern recognition algorithm, it is possible to improve the ascertaining of the anomalies by means of the data processing unit 30 of the functional unit 22. For example, using the pattern recognition algorithm, it is possible to ascertain rules, according to which the anomalies can be ascertained from the status information. If the functional unit 22 is located in the data exchange and charging zone 12, these rules can be transmitted to/installed on the functional unit (22) by the evaluation unit (24) via the data connection (26).

For example, in a first pass of the method, the plurality of transport paths 4 of the sorting installation 2 are moved

over, and in a second pass of the method, the transport paths 4 to be moved over are ascertained on the basis of the anomalies ascertained in the first pass.

This means that the transport paths 4, in which anomalies have occurred, are moved again over by the functional unit 22.

The anomalies of the status data of the sorting installation 2 are also ascertained in this second pass.

In this manner, the problem zones of the sorting installation 2 can be monitored efficiently.

Although the invention has been illustrated and described in detail by the preferred exemplary embodiments, the invention is not restricted by the examples disclosed and other variations can be derived therefrom by a person skilled in the art without departing from the protective scope of the invention.

List of reference characters

2	sorting installation
4	transport path
6	transport zone
8	diverter
10	transport direction
12	data exchange and charging zone
14	read station
16	identification mark
18	installation controller
19	data connection
20	luggage tray
22	functional unit
24	evaluation unit
25	data connection
26	data connection
28	sensor
30	data processing unit
32	transmission unit
34	data connection
36	rechargeable battery

Patentkrav

1. Fremgangsmåde til bestemmelse af en tilstand af et sorteringsanlæg (2), ved hvilket
- en funktionsenhed (22) køres via flere transportveje (4) af sorteringsanlægget (2),
- tilstandsinformation af sorteringsanlægget (2) bestemmes under anvendelse af mindst en sensor (28) af funktionsenheden (22),
- anomalier i tilstandsinformationen bestemmes ved hjælp af en databearbejdningsenhed (30) af funktionsenheden (22),
- anomalierne af funktionsenheden (22) sendes til en evalueringsenhed (24), og
- en tilstand af sorteringsanlægget (2) bestemmes ved hjælp af anomalierne, især ved hjælp af evalueringsenheden (24).

2. Fremgangsmåde ifølge krav 1,
kendetegnet ved, at
i det mindste anomalierne sammenknyttes med lokaliseringsinformation.

3. Fremgangsmåde ifølge krav 2,
kendetegnet ved, at
lokaliseringsinformationen ved hjælp af funktionsenhedens (22) databearbejdningsenhed (30) sammenknyttes med anomalierne og/eller med tilstandsinformationen.

4. Fremgangsmåde ifølge krav 2,
kendetegnet ved, at
lokaliseringsinformationen sammenknyttes med anomalierne ved hjælp af evalueringsenheden (24), f.eks. under anvendelse af tidsstempler.

5. Fremgangsmåde ifølge et af de foregående krav,
kendetegnet ved, at
funktionsenheden (22) regelmæssigt køres via de adskillige transportveje (4) af sorteringsanlægget (2).

6. Fremgangsmåde ifølge et af de foregående krav,
kendetegnet ved, at
funktionsenheden (22) kører ned ad mindst en af transportvejene (4) igen, hvor der optræder mindst en anomali, især kører ned ad de transportveje (4) igen, hvor der optræder anomalier.

7. Fremgangsmåde ifølge et af de foregående krav,
kendetegnet ved, at
der køres ned ad de adskillige transportveje (4) af sorteringsanlægget (2) ved et første gennemløb af fremgangsmåden, og
transportvejene (4), der skal køres ned ad, ved et andet gennemløb af fremgangsmåden bestemmes ved hjælp af de anomalier, der er fastslået i det første gennemløb.

8. Fremgangsmåde ifølge et af de foregående krav,
kendetegnet ved, at
sorteringsanlæggets (2) tilstandsinformation omfatter mindst en af de følgende informationstyper:
visuel information af mindst et afsnit af en af transportvejene (4),
akustisk information af mindst et afsnit af en af transportvejene (4),
hastighedsinformation af funktionsenheden (22), accelerationsinformation af funktionsenheden (22), rystelses- og/eller placeringsændringsinformation, temperaturinformation.

9. Fremgangsmåde ifølge et af de foregående krav, **kendetegnet ved, at**
evalueringsenheden (24) har en mønstergenkendelsesalgoritme, der i det mindste genkender et mønster i anomalierne, hvor der kan konkluderes en tilstand af sorteringsanlægget (2) ud fra det genkendte mønster.

10. Fremgangsmåde ifølge krav 9,
kendetegnet ved, at
bestemmelsen af anomalierne forbedres ved hjælp af funktionsenhedens (22)

databearbejdningsenhed (30) under anvendelse af mønstergenkendelsesalgoritmen.

11. Funktionsenhed (22), der kan køres via flere transportveje (4) af et sorteringsanlæg (2),
kendetegnet ved
mindst en sensor (28) til bestemmelse af tilstandsinformation af sorteringsanlægget (2), en databearbejdningsenhed (30) og en transmissionsenhed (32), hvor databearbejdningsenheden (30) er indrettet til at bestemme anomalier i sorteringsanlæggets (2) tilstandsinformation,
og hvor transmissionsenheden (32) er indrettet til at sende anomalierne fra funktionsenheden (22) til en evalueringsenhed (24), hvor en tilstand af sorteringsanlægget (2) kan bestemmes ud fra anomalierne.

12. Sorteringsanlæg (2) med flere transportveje (4), med funktionsenheden (22), der kan køres via de adskillige transportveje (4) af sorteringsanlægget (2), ifølge krav 11 samt en evalueringsenhed (24), der er indrettet til ud fra anomalierne at bestemme en tilstand af sorteringsanlægget (2).

13. Sorteringsanlæg (2) ifølge krav 12,
kendetegnet ved
en dataudvekslingszone (12), der til funktionsenheden (22) kan nås via transportvejene (4), og hvori funktionsenheden (22) via en dataforbindelse (26) kan forbindes med analyseenheden (24).

14. Sorteringsanlæg (2) ifølge krav 12 eller 13, **kendetegnet ved**
en opladningszone (12), der til funktionsenheden (22) kan nås via transportvejene (4), og som er indrettet til opladning af et genopladeligt batteri (36) af funktionsenheden (22).

15. Sorteringsanlæg (2) ifølge krav 13 og 14,
kendetegnet ved, at
opladningszonen (12) rumligt falder sammen med dataudvekslingszonen (12).

FIG 1

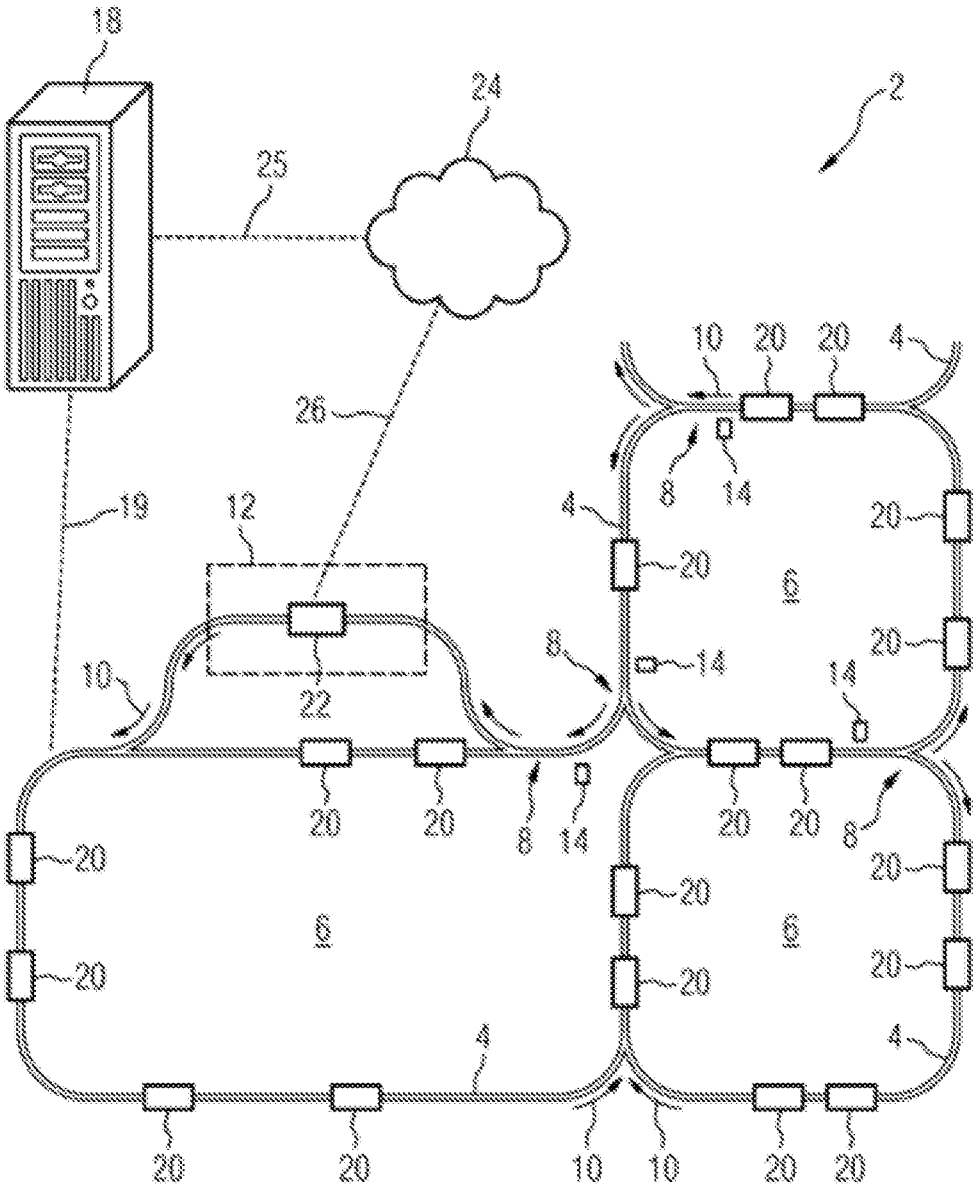

FIG 2