



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.07.2021 Bulletin 2021/29

(51) Int Cl.:
B07C 7/00 (2006.01)

(21) Application number: **20152537.5**

(22) Date of filing: **17.01.2020**

(84) Designated Contracting States:
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
 Designated Extension States:
BA ME KH MA MD TN

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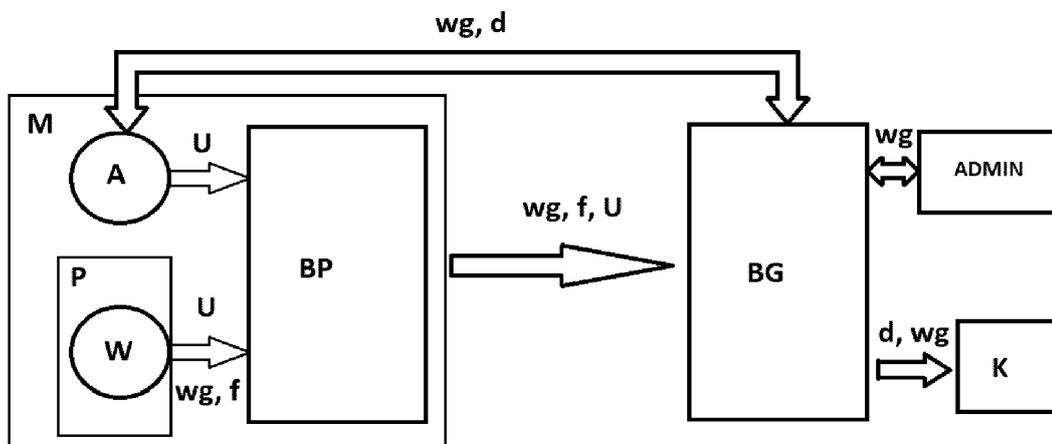
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(54) **METHOD FOR INDIVIDUALISED WASTE SEGREGATION**

(57) The invention relates to a method for individualised waste segregation, applicable in the process of preliminary acquisition of secondary raw materials from municipal waste. The method for individualised waste segregation, comprising preliminary segregation of waste by the user into individual fractions (f), automated weighing process, characterised in that using an individualising device (A), preferably in the place designed for waste collection (M), the user (U) is personalised while opening an individual account of said user (U) in the data acquisition block (BP), after which the user (U) places

waste in a designated point (P) equipped with a weighing device (W), after which the obtained weight (wg) of waste is digitised and transferred to data acquisition block (BP), where information on specific user (U), weight (wg) of waste disposed of, type of fraction (f) is combined, which information is then transferred to the data collection block (BG), where the weight (wg) of the disposed of waste of a particular fraction (f) is aggregated with periodical historical data, and the access to the individual user account (U) is closed.



Description

[0001] The invention relates to a method for individualised waste segregation, applicable in the process of preliminary acquisition of secondary raw materials from municipal waste.

[0002] Similarly to how consumers of electricity, natural gas and water pay for the quantities of individual media they have actually used, for solid waste fees for a particular weight of raw materials they generate are charged on a flat-rate basis according to the standards specified in the specific legislation.

[0003] In the case of segregated waste such as glass, plastics and metals, a secondary raw material is produced prepared for further processing, that has a market value.

[0004] The user disposing of a particular waste fraction generates negative values for the recipient, the administrator, representing his or her profit being the difference between the value of the waste disposed of by the user and the market price thereof.

[0005] The system of Individual Waste Segregation is supposed to be the basic element for our environment awareness, since it will be profitable, also in financial terms, to dispose of segregated waste for every resident of a particular city/municipality etc.

[0006] Polish document no. P.412689 discloses a method for segregation of the fact that waste, in particular municipal waste, which consists in the waste being identified based on scanner readings from the barcode on the packaging for the identification of the materials from which the packaging was made, after which the scanned data is transferred to a computer database, where identification is performed based on comparative analysis of the image from a camera located in the segregation zone against the model stored in the computer database, the results of the analysis are then transferred to a distributor, where based on the feedback from the computer database the distributor directs the waste to appropriate receptacles.

[0007] Then, the international patent document WO02076637 discloses a method for controlled manual sorting of municipal waste, comprising controlled handling of waste from the producer to the recipient thereof. The method is based on manual sorting, in the scope of pre-sorting waste in the process of production thereof, where the types and subtypes of the waste delivered by the waste producer are determined. At the designated point, waste is weighted by entering the weight thereof into a central computer. After weighing, they are transferred to sorters.

[0008] The patent description of the Chinese invention no. CN104609060 discloses a method for waste recycling pertaining to particular steps, including the registration of the name at the user's registration point by the user to operate the subscriber's account, after the user's successful identification, the operating staff opens the door of the waste cabinet, while an identifier is printed

on self-adhesive material, the user sticks the identifier and throws the bagged waste down the hatch, after which the bag is weighed, the device automatically closes the hatch, the staff classifies and processes the collected garbage bags, performs a scan, and the result is stored on the server of the device. A waste recycling cabinet includes a hardware and software components, where the hardware component comprises the cabinet body, an industrial PC and electronic scales, a display, an input device and a printer, wherein the display is installed on the control panel of the cabinet body, the input device and the printer. Electronic scales are integrated in the housing of the cabinet, a supply door is located on the front surface of the cabinet body, and a service door is located behind the cabinet body, with an electromagnetic lock being arranged on the supply door and the maintenance door, and the display, the electronic scales, the input device, the electromagnetic lock and the printer are connected to the industrial PC.

[0009] A part of the software comprises a data collection unit, a data memory unit, a control unit and a display and output unit. The data collection unit is designed to collect information on card sliding or to verify the user logging in, while the data storage unit is used to store information collected by the data collection unit. The control unit reads the recorded information from the data memory unit and controls the opening of the opening door, the maintenance door is opened, and the electronic scale is electrified. The display and output unit is designed to display information stored by the user data memory unit and to print barcodes.

[0010] The solutions known so far do not address the issue of motivating users to segregate waste by building a database of the quantities of raw materials disposed of by the user. Known solutions focus on acquiring segregated raw materials as a source for further storage or processing thereof.

[0011] The aim of the solution according to the invention is to develop a method of technical control, a method for obtaining separate and desired groups of raw materials for further processing, and to establish a motivating team to create a civic attitude of users as regards participation in the secondary raw material processing chain. The facility administrator becomes an intermediary of a kind in the trade of raw materials, gaining waste-free space, internal motivation of users as well as cost savings. The user receives remuneration for waste divided into appropriate fractions and only pays for mixed waste.

[0012] The method for individualised waste segregation, comprising preliminary segregation of waste by the user into individual fractions, automated weighing process, characterised in that using an individualising device, preferably in the place designed for waste collection, the user is personalised while opening an individual account of said user in the data acquisition block. The user places waste in a designated point equipped with a weighing device. The obtained weight of the waste is digitised and transferred to the data acquisition block, where informa-

tion regarding a specific user, weight of waste disposed of, type of fraction is combined, which information is then transferred to the data collection block, where the weight of the disposed of waste of a particular fraction is aggregated with periodical historical data, access to the individual account of user is closed.

[0013] Preferably, the individualisation of the user using the individualising device equipped with a reader is performed by means of a proximity card or QR code or barcodes placed on waste separation bags assigned to a particular user.

[0014] Preferably, the point is a drop-in kiosk or a closable weighing space.

[0015] Preferably, the user places waste in a designated point equipped with a weighing device while declaring on the screen of the weighing device the type of the fraction of the waste disposed of.

[0016] Preferably, the user places waste in a designated point equipped with a weighing device separate for each fraction of the waste.

[0017] Preferably, the waste fraction is declared by the user automatically based on a scanned barcode placed on waste bags with the corresponding colour.

[0018] Preferably, the user checks on the screen of the individualising device at the place designed for waste collection the sum of weights of the waste disposed of and/or of historical data for a particular period assigned to his or her individual account in the data collection block.

[0019] Preferably, the administrator of the site designed for waste collection has access to the information collected in the data collection block based on which he or she bills the user.

[0020] Preferably, in the data collection block, historical monthly or quarterly or half-yearly data is combined with a table of rates and an accounting document is issued containing a billing summary including the cost and remuneration differences for the waste disposed of by the user.

[0021] Preferably, the user in the data collection block, using an external telecommunications device, remotely checks the historical data collected in the data collection block, in particular data grouped within an account or a billing summary.

[0022] Preferably, the user in the data collection block, using an external telecommunications device, remotely checks the accounting status of the historical data after making the payment.

[0023] The object of the invention is illustrated in the embodiment on the attached figure, where a block diagram is presented.

[0024] In the solution according to the invention, each household will have an individual account, similarly to e.g. an existing electricity meter. The account will e.g. enable assigning a specific quantity, a specific type of waste individually for each household. The user will be able to check his account balance at any time, that is to say know how much and what type of waste he or she has collected.

[0025] Each housing community will be obliged to

equip the rooms with waste containers with a weighing device equipped with a proximity card reader and a reader of the barcode on the bags. Using a household identification card, the user will be able to log in before starting to dispose of the waste so that it is automatically assigned to his or her account.

[0026] Each individual household in which it will be impossible to use the scales will be equipped with a manual version of weighing device, which will indicate the weight of individual fractions via Bluetooth and transfer the value to the system/application on a smartphone, assigning data to a particular user account.

[0027] The system will also constitute a logistic and information platform for agents providing waste collection and disposal services to the city/municipality. When collecting waste from an individual household (detached houses), an employee of PUK (Municipality Services) will be equipped with a weighing device to verify at random the weight of individual bags. Moreover, where an underground waste container is used, the system will also be provided with information regarding the current fill level of the container, its damage or other existing issues/events. This allows for economic planning of routes for vehicles collecting particular waste fractions.

[0028] The solution according to the invention allows for establishing different billing systems between users and waste collectors. Any type of waste can be billed individually, e.g. for glass, the recipient will pay the user, while for mixed waste, the user will be charged by the recipient. Furthermore, the solution according to the invention enables billing and report generation for a specified period.

[0029] The system provides a list of transactions performed with a particular card. The user can check his or her account balance and the applicable price list. It is also possible to set up a "cafeteria" system consisting in exchanging collected points for waste segregation for various benefits (such as public transport discounts, theatre or cinema tickets).

Example 1

[0030] The method for individualised waste segregation, comprising preliminary segregation of waste by the user into individual fractions, automated weighing process, is characterised in that using the individualising device **A**, in the place designed for waste collection **M**, user **U** is individualised, while opening an individual account of this user **U** in the **BP** data acquisition block. User **U** places waste in the designated point **P** equipped with a weighing device **W**. User **U** places waste in the designated point **P** equipped with a weighing device **W**, while declaring on the screen of the weighing device **W** the type of the disposed of waste fraction **f**. The obtained weight **wg** of the waste is digitised and transferred to the data acquisition block **BP**, where information regarding a specific user **U**, weight **wg** of waste disposed of, type of fraction **f** is combined, which information is then trans-

ferred to the data collection block **BG**, where the weight **wg** of the disposed of waste of a particular fraction **f** is aggregated with periodical historical data, access to the individual account of user **U** is closed. User **U** is personalised using an individualising device **A** equipped with a reader is performed by means of a proximity card. The point **P** is a drop-in kiosk. The administrator of the site designed for waste collection **M** has access to the information collected in the data collection block **BG** based on which he or she bills the user **U**. In the data collection block **BG**, the user **U**, using an external telecommunications device **K** remotely checks the historical data collected in the data collection block **BG**, in particular data grouped within an account or a billing summary.

Example 2

[0031] The method for individualised waste segregation, comprising preliminary segregation of waste by the user into individual fractions, automated weighing process, is characterised in that using the individualising device **A**, in the place designed for waste collection **M**, user **U** is individualised, while opening an individual account of this user **U** in the **BP** data acquisition block. User **U** places waste in the designated point **P** equipped with a weighing device **W**. User **U** places waste in the designated point **P** equipped with a weighing device **W**, while declaring on the screen of the weighing device **W** the type of the disposed of waste fraction **f**. The obtained weight **wg** of the waste is digitised and transferred to the data acquisition block **BP**, where information regarding a specific user **U**, weight **wg** of waste disposed of, type of fraction **f** is combined, which information is then transferred to the data collection block **BG**, where the weight of the disposed of waste of a particular fraction **f** is aggregated with periodical historical data, access to the individual account of user **U** is closed. User **U** is personalised using an individualising device **A** equipped with a reader is performed by means of a QR code placed on bags for waste segregation assigned to a particular user **U**. The point **P** is a closable weight space. The administrator of the site designed for waste collection **M** has access to the information collected in the data collection block **BG** based on which he or she bills the user **U**. In the data collection block **BG**, the user **U**, using an external telecommunications device **K** remotely checks the historical data collected in the data collection block **BG**, in particular data grouped within an account or a billing summary. In the data collection block **BG**, historical monthly or quarterly or half-yearly data is combined with a table of rates and an accounting document is issued containing a billing summary including the cost and remuneration differences for the waste disposed of by the user **U**. The user **U** in the data collection block **BG**, using an external telecommunications device **K**, remotely checks the accounting status of the historical data after making the payment.

Claims

1. The method for individualised waste segregation, comprising preliminary segregation of waste by the user into individual fractions, automated weighing process, **characterised in that** using an individualising device (**A**), preferably in the place designed for waste collection (**M**), the user (**U**) is personalized while opening an individual account of said user (**U**) in the data acquisition block (**BP**), after which the user (**U**) places waste in a designated point (**P**) equipped with a weighing device (**W**), after which the obtained weight (**wg**) of waste is digitised and transferred to data acquisition block (**BP**), where information on specific user (**U**), weight (**wg**) of waste disposed of, type of fraction (**f**) is combined, which information is then transferred to the data collection block (**BG**), where the weight (**wg**) of the disposed of waste of a particular fraction (**f**) is aggregated with historical periodical data (**d**), and the access to the individual user account (**U**) is closed.
2. The method according to claim 1, **characterised in that** the personalization of the user (**U**) using the individualising device (**A**) equipped with a reader is performed by means of a proximity card or QR code or barcodes placed on waste separation bags assigned to a particular user (**U**).
3. The method according to claim 1, **characterised in that** the place designed for waste collection (**M**) is a drop-in kiosk or a closable weighing space.
4. The method according to claim 1, **characterised in that** the user (**U**) places waste in a designated point (**P**) equipped with a weighing device (**W**) while declaring on the screen of the weighing device (**W**) the type of the fraction (**f**) of the waste disposed of.
5. The method according to claim 1, **characterised in that** the user (**U**) places waste in a designated point (**P**) equipped with a weighing device (**W**) separate for each fraction (**f**) of the waste.
6. The method according to claim 1, **characterised in that** the waste fraction (**f**) is declared by the user (**U**) automatically based on a scanned barcode placed on waste bags with the corresponding colour.
7. The method according to claim 1, **characterised in that** the user (**U**) checks on the screen of the individualising device (**A**) at the place designed for waste collection (**M**) the sum of weights (**wg**) of the waste disposed of and/or of historical data (**d**) for a particular period assigned to his or her individual account in the data collection block (**BG**).
8. The method according to claim 1, **characterised in**

that the administrator of the site (ADMIN) designed for waste collection (M) has access to the information collected in the data collection block (BG) based on which he or she bills the user (U).

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9. The method according to claim 8, **characterised in that** in the data collection block (BG), historical monthly or quarterly or half-yearly data (d) is combined with a table of rates and an accounting document is issued containing a billing summary including the cost and remuneration differences for the waste disposed of by the user (U).

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10. The method according to claim 1, **characterised in that** the user (U) in the data collection block (BG), using an external telecommunications device (K), remotely checks the historical data (d) collected in the data collection block (BG), in particular data grouped within an account or a billing summary.

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11. The method according to claim 8, **characterised in that** in the user (U) in the data collection block (BG), using an external telecommunications device (K), remotely checks the accounting status of the historical data (d) after making the payment.

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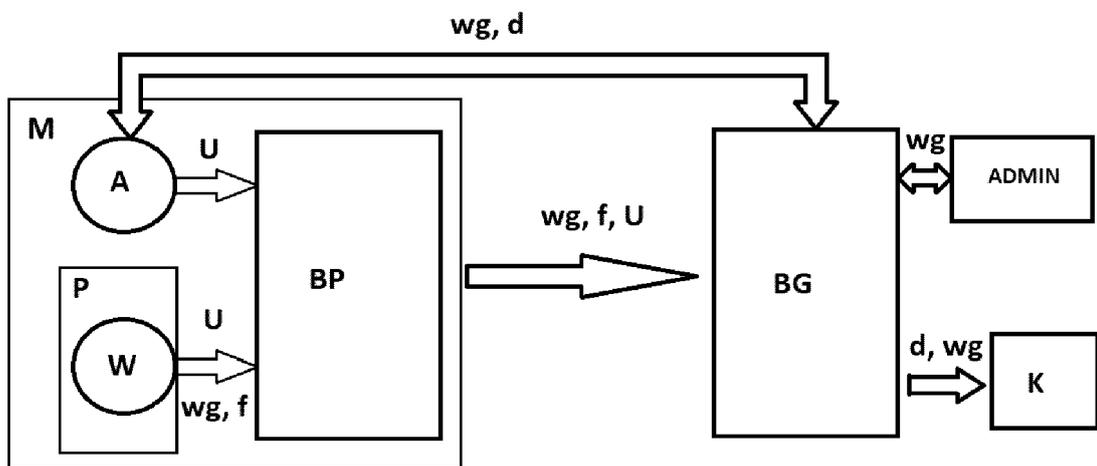
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EUROPEAN SEARCH REPORT

Application Number
EP 20 15 2537

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2013/089649 A1 (CERAR JANKO [SI]; NOVAK PETER [SI] ET AL.) 20 June 2013 (2013-06-20) * the whole document * -----	1-11	INV. B07C7/00
X	WO 2019/162710 A1 (STENGOS GEORGIOS [GR]; PAPANAGIOTOU ANASTASIOS [GR] ET AL.) 29 August 2019 (2019-08-29) * the whole document * -----	1-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B07C
Place of search		Date of completion of the search	Examiner
Munich		17 June 2020	Wich, Roland
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EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 20 15 2537

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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17-06-2020

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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