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(54) System of differentiated waste collection by means of coded collection bags.

(57) The present invention relates to a system of differentiated waste collection by means of coded collection bags (20) that must be recognised by a reader (14) positioned on a container (10) that enables the opening of the covering element (12) of the container (10) and makes it possible to place in the container (10) the bag (20) containing a specific type of waste.

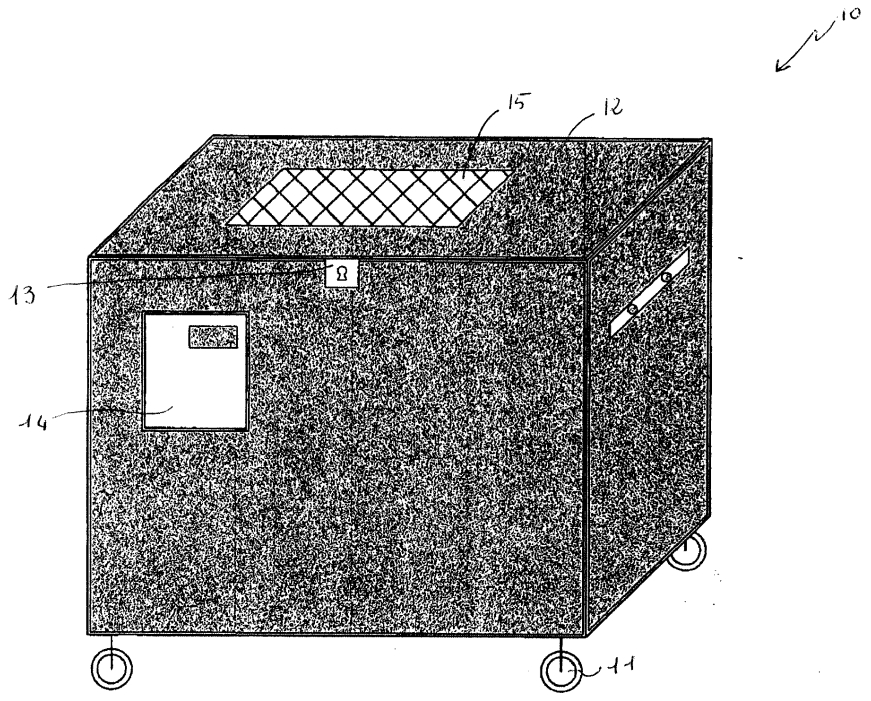

FIG.1

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Description

[0001] The present invention concerns a system of differentiated waste collection by means of coded collection bags, particularly suitable to offer users an improved management of the waste collection service.

[0002] As is known, waste collection is a very heartfelt and topical issue due to a series of problems related to the differentiation and sorting of waste and to its collection, management and transport.

[0003] Currently, different waste collection systems are in use, such as the classic bins placed in many preset points, where waste is placed at the discretion of the users; this systems causes several problems, including waste that is not sorted, dumping of waste in the incorrect bins, and the presence of bags on the ground when the bin is full, which causes litter and dirt and somewhat uncontrolled situations when the collection is not timely and efficient. Another system which is widely used at the moment, is the door- to-door collection system, whereby each user, whether it be a family or block of flats, is given a series of small dedicated containers or bags of different colours for the different categories of waste; the containers are emptied/collected by waste collectors on specific days according to the type of waste. This system prevents the uncontrolled accumulation of waste described previously but, unfortunately, still entails a series of problems. In fact, the waste is kept in the house until the "right" collection day taking up a great deal of space, which is a problem especially in apartments where space is very limited and it is difficult to find a place for the containers; the containers usually end up on the balconies, which is not pleasant to see, and often, especially in the summer, they are the source of bad smells due to the fermentation of wet waste, which also leads to the proliferation of unpleasant insects, etc. Furthermore, there is the burden of remembering the right collection day and remembering to take out the container/bag at the scheduled time, with the risk, for example, of missing the day and having to keep the waste for another week. In addition, another drawback is due to the fact that the containers that have not been emptied or bags that have not been collected remain in the street, with the risk of having bags of different colours or containers that may tip over in the streets. Another problem encountered concerns the access of waste collectors to private property, which for example can mean that the property's gate must be left open on the day of the collection, which actually means that it is left open on a number of days as the different types of waste are collected on different days; otherwise the user has the burden of taking the bag or container in the street and then taking it back in the house in the evening.

[0004] Another problem related to the previous system is the difficult management of public holidays and Sundays, especially in tourist areas, where visitors do not know where and how to leave the waste produced.

[0005] Last but not least there is the high cost of the collection service which is charged to the users in the form of household waste tax.

[0006] A different system is the collection in specific collection sites, so-called household waste disposal and recycling sites, with special containers. With this system, many of the drawbacks described above are resolved and there is the advantage that waste can be delivered at any time and the collection cost is reduced as the waste collectors only have to collect in these specific areas; however some problems still remain.

[0007] A first drawback is related to the disposal of the waste, which is often undisciplined, so waste is left on the ground or mixed or placed in the wrong containers; the disposal is anonymous therefore it is not possible, for example, to fine who makes a mistake or leaves waste that is not correctly sorted, etc. In addition, the household waste disposal and recycling sites are often out of town or in any case they are not close therefore a car is needed to take the waste to the site; this situation creates great problems, especially for the elderly who do not drive and have to depend on someone or a family member to take them to the household waste disposal and recycling sites or they have to make more than one journey to dispose of their waste.

[0008] Another problem is related to the fact that at household waste disposal and recycling sites when it is time to empty the containers they are either overfilled or half empty; this results in a non-uniform distribution and extra work by the collectors to remove excess waste in order to be able to empty the containers into trucks that transport it to the landfill or incinerator; this also results in unnecessary emptying of the containers if they are not full. In both cases there is an increase in management costs.

[0009] In addition to what has been described above, tourist areas have to dispose of significant amounts of waste produced by tourists on certain days, especially Sundays and public holidays; in this case, the collection and disposal costs are paid by the local council and by those who are resident in the town. A further problem is created by the fact that this type of waste is produced by people who stay in the town for a few hours or a few days therefore it is not sorted and it is often disposed of in a disorganised and disorderly manner and often not in the dedicated containers or areas. Another system foresees the presence of collection points with containers fitted with opening mechanisms for which a key or card is necessary.

[0010] The system just mentioned solves the problems described with the previous system, but only authorised persons (in possession of the key/card) can access the service. This condition allows for good monitoring of waste production and of the methods of disposal in the containers, and this makes it possible to produce statistics on the users in order to better organise the service, for example, by placing a greater number of containers in areas where the disposal of waste is greater or reducing them where less waste is disposed of, and this also

in relation to the kind of waste. Furthermore, with this system it is possible to monitor the containers even at a distance with the presence of cameras or with a link to the container, and the data collected can be used to optimise the service.

[0011] This system also has drawbacks as the management of keys/cards is quite laborious for various reasons: the key/card is frequently lost and must be duplicated, demagnetisation of the cards, payment of a deposit for the key/card, management costs, etc. In addition the distribution of the keys/cards to the users is also quite laborious.

[0012] In addition if you do not have the key/card at hand, you cannot access the service. In fact, if a user forgets the key/card at home/in the office or if a family member, who is not present, has it, it is not possible to dispose of the waste. Furthermore, this system is quite inconvenient and complicated because if, for example, a user is holding a waste bag and has the key/card in his/her bag or wallet/purse, the person must place the bag on the ground, search for the key/card, open the container, put the key/card in his/her pocket, and finally dispose of the waste. It has happened that the key has sometimes been thrown away with the bag, and then it must be either retrieved or a duplicate must be requested with consequent costs.

[0013] In particular, this system does not solve the impacting problem related to the management of the occasional need for the service, for example in the case of tourists, campers, associations, events, work sites, etc. ; this important problem is shared also by the systems previously mentioned but in this system and in the door-to-door system it is of greater importance due to the fact that the waste is collected already sorted and on different days during the week, according to the type of waste.

[0014] The object of the present invention is substantially to solve the problems of the known technique overcoming the above mentioned difficulties by means of a system of differentiated waste collection by means of coded collection bags particularly suitable to offer to anyone, users, residents and guests, the possibility of placing differentiated waste in special containers at any moment.

[0015] A second aim of the present invention is to develop a system of differentiated waste collection by means of coded collection bags, where the bags can be purchased from the service manager, shops/supermarkets or from simple automatic distributors positioned near the containers.

[0016] Another aim of the present invention is to develop a system of differentiated waste collection by means of coded collection bags in which the possession of a bag suitable for the type of waste enables access to the system and service.

[0017] A further aim of the present invention is to develop a system of differentiated waste by means of coded collection bags that makes the waste collection service efficient, very organised, monitored and above all with the economic contribution of whoever takes advantage of it.

[0018] A still further but not final aim of the present invention is to develop a system of differentiated waste collection by means of coded collection bags that is easy to manufacture and works well.

[0019] These aims and others besides, which will better emerge over the course of the present description, are essentially achieved by means of a system of differentiated waste collection by means of coded collection bags, as outlined in the claims below.

[0020] Further characteristics and advantages will better emerge in the detailed description of a system of differentiated waste collection by means of coded collection bags according to the present invention, provided in the form of a non-limiting example, with reference to the accompanying drawings, in which:

- figure 1 shows, schematically and from a perspective view, a container that adopts a system of differentiated waste collection by means of coded collection bags according to the present invention;
- figure 2 shows, schematically, a bag for the system in question.

[0021] With reference to the aforementioned figures, and in particular to figure 1, 10 denotes, as a whole, a container used in the system of differentiated waste collection by means of coded collection bags, according to the present invention that is designed to house the coded bags shown in figure 2.

[0022] The container 10 is a container for the collection of waste of the bin type or a normal plastic or metal container in the shape of a parallelepiped, which has a wheeled base 11 for easy and practical handling, a covering element 12 of the inner compartment designed to house bags containing waste.

[0023] In addition, the container 10 has a mechanism for opening closing the covering element 12 consisting of, for example, a lock to close the container and/or a mechanical device that opens the covering element, a reader 14 preferably positioned on the front part of the container in a position which is convenient and accessible for a user, as will be explained below.

[0024] In more detail, the container comprises supplying means for supplying the reader and an opening/closing mechanism that consist of a battery, also of the rechargeable type, located on the structure of the container such as, for example, below the base and in any case in a position not easily accessible to unauthorised people to prevent tampering. The said battery is charged either by being connected to the power supply or by means of the solar panel 15, placed on the covering element 12, as shown in figure 1.

[0025] The system of differentiated waste collection according to the present invention foresees the use of a collecting bag 20, on the outer surface of which it has a code 21 as shown in figure 2.

[0026] The bag is made of biodegradable material and/or paper for waste defined as "wet", of paper for paper waste and of plastic for waste made of plastic so that the waste and the waste bag are preferably compatible.

[0027] The various types of bag can be purchased from the manager of the collection service, such as the council, distributed by shops or be sold though automatic distributors positioned near the areas where the containers are placed or in set places. The purchase price of the bags can include in part or in whole the cost of the collection service.

[0028] In this way, the possession of the "right" bag enables access to the container and to the system.

[0029] In addition to the above, the code in the bag has several functions including enabling the dedicated container to be identified and acting as a key for opening the container in as much as the reader 14, recognising the type of code, releases the container closing mechanism and the user can open the closing element of the container manually or it opens automatically so the user can place the bag inside the container. Furthermore, the code can contain data that identify the user, the place of residence, etc.

[0030] The system in question makes it possible to throw waste in the dedicated containers in a simple and organised manner, since it does not require keys or cards that can be easily lost or forgotten, as used to happen with the systems of the known technique; in addition one hand is sufficient as the user holding the bag in his/her hand, has to place the identification code of the bag on the reader, which recognises it and opens the container so that the user can throw the bag into the container, which will then close automatically. When the reader does not recognise the bag with the code because the bag is for another type of waste or because the code is false the container does not open.

[0031] According to the present invention, a variant of the covering element 12 envisages that, once the reader has detected the code, the opening mechanism instead of fully opening the covering element of the container, only opens a portion, that is to say a section in which to place the bag, which with its weight closes it.

[0032] The system foresees, for example, that the service manager supplies to a user family a predetermined number of bags, one per week for each type of waste upon payment of a fee. If the user uses the bags assigned in less time than expected, he/she may purchase other bags from the service manager or from a shop or from the automatic distributors.

[0033] With this system, if the "wet" waste is transformed into compost, for example, the user does not pay for the collection service for this type of waste.

[0034] In addition to the above, the system envisages a single bag to place all types of waste in a special container, at a cost of the bag which is higher than the others, to entice, for example, tourists and participants in events not to abandon or leave rubbish, without the burden however of having to sort the waste; at the same time they would contribute to the cost of the service as opposed to what currently happens, where the costs for the service in tourist areas are covered by the councils.

[0035] After the predominantly structural description above, the operation of the invention in question will now be outlined.

[0036] When a user needs to dispose of waste of a well-defined type, he/she just has to get the proper bag with code, put the waste into the bag, close it and go to the dedicated container. When the user reaches the container, he/she must pass the code printed on the bag on the reader positioned on the collection container; the reader recognises the code, sends a signal to activate the opening mechanism of the covering element of the container and the bag can be thrown in the container and immediately after the covering element closes.

[0037] Thus the present invention achieves the aims set.

[0038] In fact, the system of differentiated waste collection by means of coded collection bag, in question, allows any user who has a suitable coded bag, to place differentiated waste in special containers at any time; the users can be residents, occasional users such as tourists or people passing though, for example, campers or truck drivers or other users as previously indicated. Advantageously, with the system in question the coded bag can be distributed by the manager of the waste collection service, it can be purchased in shops, supermarkets or purchased from automatic distributors placed, for example, near the containers.

[0039] In particular, the simple possession of the bag suitable for the type of waste enables access to the system and service.

[0040] Advantageously, the system, according to the present invention, makes the waste collection service efficient, very organised, controlled and above all the cost is borne by whoever uses the service, whether it be a resident or occasional user; it allows a fair and equitable charge of the costs in proportion to the amount of waste actually produced and not as currently occurs on the basis of the surface of the house, which may be very large but only used by a single elderly person that produces much less waste than a large family that lives in a small apartment.

[0041] In fact, as previously mentioned, the code present on the bags can include an element that identifies the family or the area and, in this way, data can be collected to monitor the quantities of waste placed, the areas of major production to organise better the emptying of the containers when they are actually full, enabling optimum management of the service, increasing/reducing the need for collection vehicles to come for each type of waste. In fact, using the reader it is possible to know how many bags have been introduced into the container so that it is also possible to know the days in the week on which a greater number of bags is placed. In particular, as the bag has a cost, this leads the users to filling it completely with a saving in time on the waste manage-

ment costs.

[0042] The system also makes it possible, by means of the reader to alert, through a message, to the fact that the container is full and to activate the operator for emptying; this enables to optimise the journeys for emptying the containers, making the service more efficient and less unfocussed, for example compared to the time employed for the door-to-door collection.

[0043] In addition to the above, this system solves all the problems previously described of the door-to-door system, household waste disposal and recycling sites with time and location restrictions or those of the bins with key/card system.

[0044] A further advantage is the saving of the service manager and thus, for example, of the council in the management of the service, since the journeys and routes of the waste collectors are significantly reduced and this translates into a reduction of costs and consequently of the prices for users. A further but not final advantage of the present invention is that it proves remarkably easy to use and to manufacture and works well.

[0045] Naturally, further modifications or variants may be applied to the present invention while remaining within the scope of the invention that characterises it.

Claims

1. System of differentiated waste collection by means of coded collection bags that uses a container for collecting the waste and the collection bags (20) **characterised in that** said container(10) has:

   - a base on wheels (11) for easy and practical movement,
   - a covering element (12) for covering the internal container designed to receive bags containing waste that features an opening/closing mechanism,
   - a reader (14) preferably positioned in the front part of the container in a position that is comfortable and accessible for a user,
   - supplying means (14) for supplying the reader and an opening/closing mechanism that consist of a battery, also of the rechargeable type, located on the structure of the container,

     - - a solar panel (15) located on the covering element (12) set up to feed said battery, and said collecting bag (20), on the outer surface of which it has a code (21) that enables access to the collecting system.

2. System of differentiated waste collection by means of coded collection bags according to claim 1, **characterised in that** said battery is charged either by being connected to the power supply or by means of the solar panel 15.

3. System of differentiated waste collection by means of coded collection bags according to claim 1, **characterised in that** said bag (20) is made of biodegradable material and/or paper for waste defined as "wet", of paper for paper waste and of plastic for waste made of plastic so that the waste and the waste bag are preferably compatible.

4. System of differentiated waste collection by means of coded collection bags according to claim 1, **characterised in that** the code in the bag has several functions, including:

   - enabling the dedicated container to be identified,
   - acting as a key for opening the container inasmuch as the reader (14), recognising the type of code, releases the container closing mechanism,
   - containing data that identify the user, the place of residence, etc.

5. System of differentiated waste collection by means of coded collection bags according to claim 1, **characterised in that** the system provides the use of a single bag provided with a code for being able to place all types of waste in an undifferentiated manner in a suitable container.

6. System of differentiated waste collection by means of coded collection bags according to claim 1, **characterised in that** through the reader (14) and the number of bags introduced into the container it is possible:

   - to monitor the quantities of waste placed, the areas of major production to organise better the emptying of the containers when they are actually full, enabling optimum management of the service, increasing/reducing the need for collection vehicles to come for each type of waste,
   - knowing how many bags have been introduced into the container so that it is also possible to know the days in the week on which a greater number of bags is placed,
   - alerting through a message to the fact that the container is full and activating the operator for emptying, enabling optimising of the journeys for emptying the containers and making the service more efficient and less unfocussed.

7. System of differentiated waste collection by means of coded collection bags, **characterised in that** the system consists of the following operations:

   - acquiring the coded bag from the service manager, or shops or automatic distributors,
   - filling the bag with the waste corresponding to

the type of bag chosen,
- approaching the collecting container,
- transferring the identification code on the bag to the reader on the container,
- recognising the code,
- activating the opening/closing mechanism of the container,
- opening the covering element,
- introducing the bag inside the container,
- closing the covering element.

8. System of differentiated waste collection by means of coded collection bags according to claim 7, **characterised in that** it does not recognise the identification code of the bag that involves the non opening of the covering element when the code is incorrect because of the type of container or because the code is false.

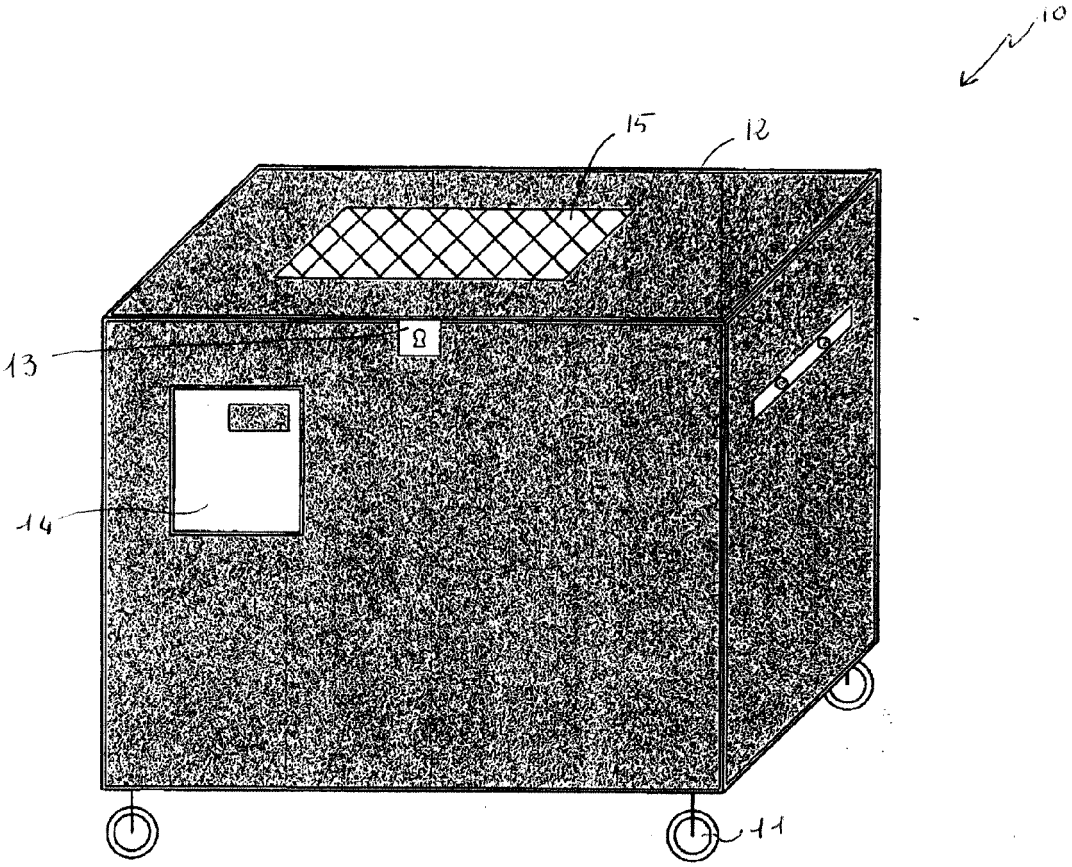

FIG.1

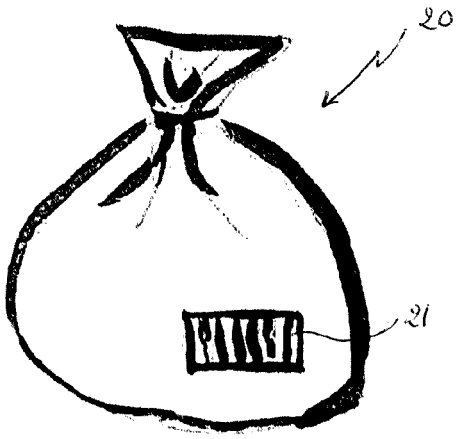

FIG.2

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EUROPEAN SEARCH REPORT

Application Number
EP 14 42 5085

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 2013/069029 A1 (HERA S.P.A.) 16 May 2013 (2013-05-16) * the whole document *	1-8	INV. B65F1/14
A	US 2008/067227 A1 (J. POSS ET AL.) 20 March 2008 (2008-03-20) * paragraph [0020] - paragraph [0028] * * figures 1-4 *	1-8	
A	GB 2 449 710 A (N. SHASHA) 3 December 2008 (2008-12-03) * the whole document *	1	
A	DE 20 2006 013156 U1 (L. HOLUBCHUK) 1 March 2007 (2007-03-01) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 October 2014	Smolders, Rob

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 42 5085

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24-10-2014

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