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(54) **A device for detecting and signalling the presence of metal objects inside a refuse container**

(57) The present invention relates to a device that is able to signal the presence of metal objects that are erroneously thrown into a refuse container.

Said device is designed to be applied to or integrated

in the opening for loading of the refuse container, and in that it is provided with means for detecting and signalling the passage of metal objects, such as, for example, cutlery.

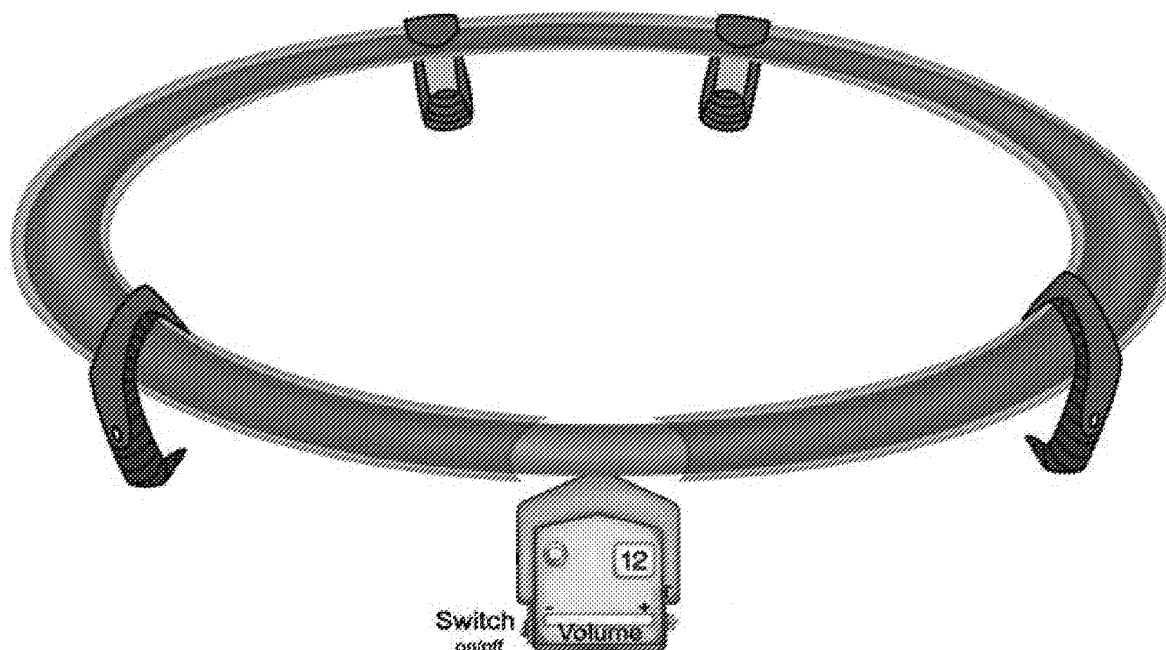


FIG. 1

Description

[0001] The present invention relates to a device that is able to signal the presence of metal objects that are erroneously thrown into a refuse container.

[0002] It is known how frequently, especially in the catering sector, but also at a domestic level, it happens that some of the items of cutlery removed from tables after meals are erroneously thrown away amongst the refuse together with the remains of the food contained in the dishes that are emptied out into the refuse container before being put to be washed.

[0003] In restaurants and pizza parlours, said problem is particularly felt in so far as the amount of cutlery that gets lost in this way may even be considerable, especially on days when there is a large number of customers and it is necessary to be particularly fast in clearing and preparing tables.

[0004] Currently, the only way of preventing this problem is to count the cutlery at the moment of closing of the premises and, in the case where the count reveals that some items are missing, it to go and rummage in the rubbish bags that have accumulated on that day to look for any cutlery that is missing.

[0005] Evidently, this entails an excessive burden on both the person running the business and the waiters, so that said check is never carried out and periodically the necessary cutlery is simply repurchased.

[0006] The main purpose of the invention is to find a way to overcome the aforesaid problems by providing an apparatus that is able to signal immediately the fact that one or more items of cutlery have been thrown away amongst the refuse.

[0007] This purpose has been achieved, according to the invention, by providing a device that can be applied or integrated on the opening for loading the refuse container, said device being provided with means for detecting and signalling the passage of metal objects, such as, for example, cutlery.

[0008] A better understanding of the invention will be obtained from the ensuing detailed description with reference to the attached figures, which illustrate, purely by way of non-limiting example, a preferred embodiment thereof.

[0009] In the drawings:

Figure 1 is a schematic 3D view of the device according to the invention, which is to be installed on the perimetral rim of the opening of a refuse container;

Figures 2, 3, 4 and 5 show details regarding the main components of the invention.

[0010] With reference to the figures, the device according to the invention basically comprises a metal detector, which is designed to be installed on the rim of the opening of a refuse container in such a way that, if a metal object enters said container, its passage is immediately detect-

ed and signalled by the metal detector by means of appropriate acoustic and visual warning means constituted preferably by a LED and by an acoustic warning device with adjustable volume.

[0011] The device that is described is preferably equipped with an ON/OFF switch, as well as with a counter that signals the number of metal objects that have entered the refuse container.

[0012] The device may be indifferently battery-supplied, preferably with batteries of a rechargeable type, or else have a direct electrical supply.

[0013] In the case of rechargeable batteries, it is possible to provide a plug for insertion of the supply cable during periods in which it is not in use, or else provide a removable battery pack that can be replaced with a pack of charged batteries or a pack being charged in a battery charger of a known type.

[0014] For installation of the device according to the present invention, three or more clips are provided, which are designed to be clipped to the rim of the opening for loading of the refuse container so as to keep the ring of the metal detector firmly adherent to the entire perimeter of said opening.

[0015] It is also preferable to provide an element for covering and protection of said ring, which will preserve it from dirt and any possible damage.

[0016] In the example described, the device is basically constituted by a ring that is preferably flexible and can be adapted to the shape and size of the opening of the refuse container to which it is applied.

[0017] This peculiar characteristic of the invention enables installation of the device on any refuse container of a known type available on the market, irrespective of its shape and without any need for particular pre-arrangements or modifications to the container itself.

[0018] According to the invention, an electronic control unit is provided which can be connected to the ring of the metal detector and comprises all the electronics necessary for operation of the device described so far. In addition, said electronic control unit preferably comprises also the battery compartment so that it can be easily removed when the refuse bag introduced into the container is to be removed or for cleaning of the container itself.

[0019] In the light of what has been said so far, it is evident that the same inventive idea underlying the invention can be applied without any modifications by providing a refuse container the main body of which that is to receive the refuse bag is already provided with the device described herein for detecting metal objects and signalling their presence.

Claims

1. A device for detecting and signalling the presence of metal objects inside a refuse container, **characterized in that** it is designed to be applied to or integrated in the opening for loading the refuse con-

tainer, and **in that** it is provided with means for detecting and signalling the passage of metal objects, such as, for example, cutlery.

2. The device according to the preceding claim, **characterized in that** it substantially comprises a metal detector, which is designed to be installed along the edge of the opening of a refuse container, in such a way that, if a metal object enters said container, its passage is immediately detected and signalled by the metal detector by means of appropriate acoustic and/or visual warning means. 5
3. The device according to the preceding claim, **characterized in that** said visual warning means comprise at least one LED and **in that** said acoustic warning means comprise at least one acoustic warning device preferably with adjustable volume. 10 15
4. The device according to Claim 1 or Claim 2, **characterized in that** it is equipped with an ON/OFF switch, as well as a counter that signals the number of metal objects that have entered the refuse container. 20 25
5. The device according to Claim 1, **characterized in that** it is supplied by batteries, preferably of a rechargeable type, or else by mains supply.
6. The device according to Claim 2, **characterized in that** it envisages three or more clips, which are designed to be clipped to the edge of the opening for loading the refuse container so as to keep the ring of the metal detector firmly adherent to the entire perimeter of said opening. 30 35
7. The device according to the preceding claim, **characterized in that** it envisages an element for covering and protection of the ring of the metal detector, which is designed to preserve it from dirt and from any possible damage. 40
8. The device according to the preceding claim, **characterized in that** it envisages an electronic control unit, which can be connected to the ring of the metal detector and comprises all the electronics necessary for operation of the device itself. 45
9. The device according to the preceding claim, **characterized in that** said electronic control unit comprises also the battery compartment so that it can be easily removed when the bag for the refuse introduced into the container is to be taken out or for cleaning of the container itself. 50 55
10. The device according to Claim 1, **characterized in that** it is basically constituted by a flexible ring that can be adapted to the shape and

size of the opening of the refuse container to which it is applied; it being thus obtained that the device can be installed on any refuse container of a known type, irrespective of its shape and without the need for particular pre-arrangements or modifications to the container itself.

11. A refuse container, **characterized in that** it comprises a device for detecting and signalling the presence of metal objects, as per the preceding claims.

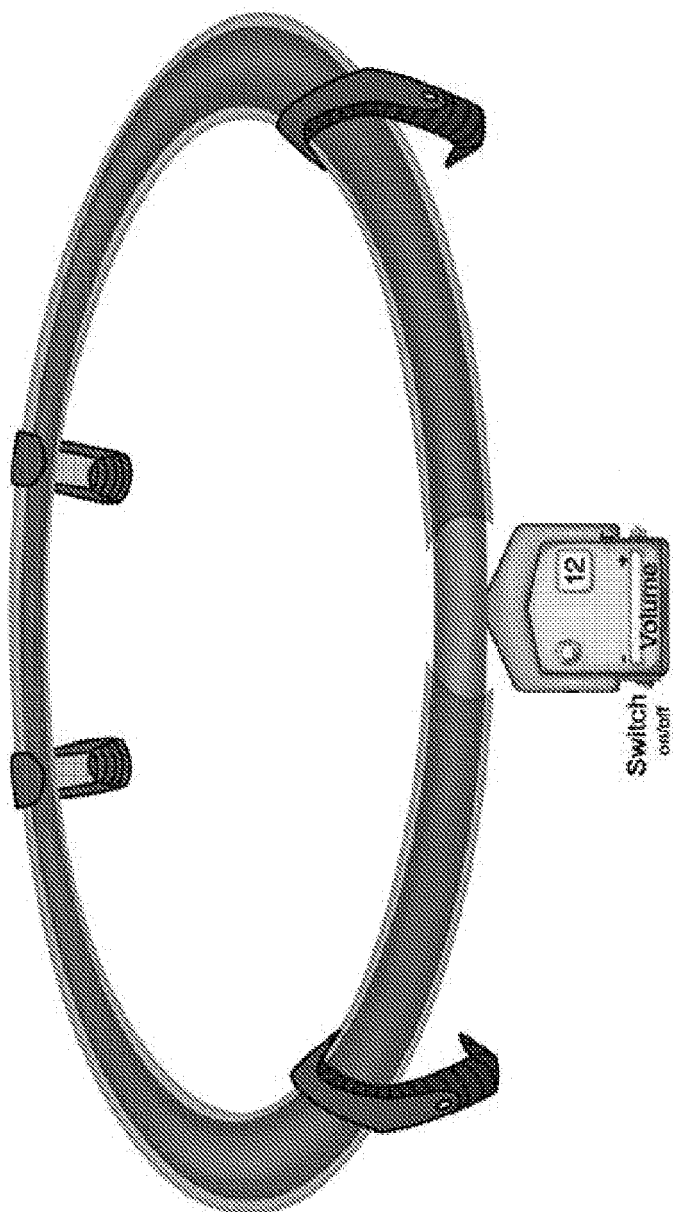


FIG. 1



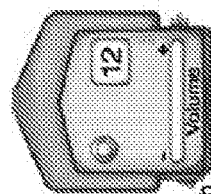
COVER

FIG. 2



RING

FIG. 3



UNIT

FIG. 4



CLIPS

FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 6268

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 A	US 7 296 683 B1 (K. VALLELONGA, SR. ET AL.) 20 November 2007 (2007-11-20) * column 3, line 50 - column 6, line 57 * * figures 1-9 *	1-3,5, 7-11 4,6	INV. B65F1/14
X A	US 6 833 789 B1 (B. CARMEN ET AL.) 21 December 2004 (2004-12-21) * column 2, line 35 - column 4, line 39 * * figures 1-9 *	1,2,4,5, 7-9,11 3,6,10	
X A	US 4 742 339 A (N. BAZIUK) 3 May 1988 (1988-05-03) * column 2, line 53 - column 4, line 15 * * figures 1-3 *	1,2,4,5, 8,9,11 3,6,7,10	
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X A	US 5 001 425 A (T. BELING ET AL.) 19 March 1991 (1991-03-19) * column 3, line 10 - column 7, line 13 * * figures 1-4 *	1,2,5, 7-9,11 3,4,6,10	TECHNICAL FIELDS SEARCHED (IPC) B65F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 May 2010	Examiner Smolders, Rob
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 15 6268

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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21-05-2010

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