

Efficient process of managing
radio frequency identification
tags
for determination of missing
labels and collection of
informations



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PATENT STATUS: GRANTED

PRIORITY NUMBER: 102014902313662

GRANT DATE: 16/02/2017

Invention

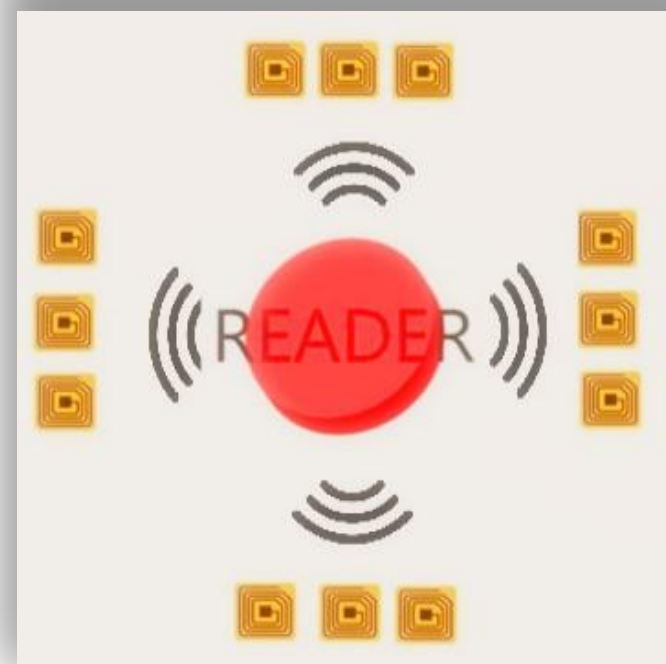


The invention relates to a **process for managing tags in an RFID system**, which features an optimization in time and energy consumption of communications between a reader and a plurality of tags interrogated by it cyclically.

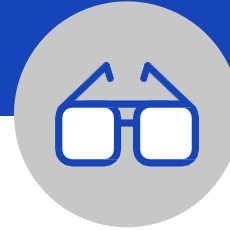
The need to track the presence and movement of objects, for example goods in a warehouse for inventory purposes or goods transported from the production site to the sales site, has led to the development of numerous identification techniques. Among them, the most widespread technique is based on radio-frequency identification systems which, by comparison with other marking systems, for example by means of bar codes, allow to operate more efficiently, even at a distance from the objects to be identified.

The aim of the present invention is to achieve in **the shortest possible time** and with **the lowest possible energy consumption** the identification of missing labels and the collection of information from said labels. Furthermore, it is important achieve the above results without compromising the simplicity of current radio frequency identification systems, in which the components, in particular the radio frequency **identification tags**, must be **simple and cost-effective**, since they are often disposable devices.

Drawings
& pictures



Industrial applications



Radio frequency identification systems are currently used in numerous applications, for example in public transportation, access control, industrial production control, electronic payments, and animal and human identification and tracking.

Recently, the use of increasingly **sophisticated radio frequency identification tags** has been proposed as part of the evolution of communication networks between objects, for the development of technology known as the "**Internet of Things**". Among these uses, two applications are of special importance: the identification of missing labels and the collection of information from the present labels.

The proposed technology can be, therefore, applied in **various industrial scenarios** for the management of large warehouses and stores; for control or inventory activities; to automate counting operations to reduce errors; for the determination of missing items or false items; for the collection of multiple information related to the products.

The patented technology can play a particular important role in various industrial departments:

- **Manufacturing and Processing** - to automate inventory tracking and the manufacturing process and/or warehouse order fulfillment;
- **Supply Chain Management** - for inventory tracking, logistics management, missing item determination;
- **Retail** - for inventory control and customer information, early detection of theft of dangerous or valuable items, automated checkout with reverse logistics.

Possible developments



The RFID network demonstrated some major problems over time, such as the rapid and reliable identification of all tags in the reader range. Since the transmission medium is shared, the typical problem to be addressed is to avoid or limit interferences between different tags, i.e., the number of repeated or missed transmissions.

The activities involved the study of **various software that could achieve the highest performance levels** of the patented technology by means of:

- protocol to avoid collisions in the transmission of tags;
- maximum speed protocol to determine missing tags;
- maximum speed protocol for determining cloned tags;
- maximum speed protocol for tag appeal;
- maximum-speed protocol for collecting information from tags.

The counterpart, however, has to be represented from the most **sophisticated hardware** for use in low-cost tag production.

For more information:



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