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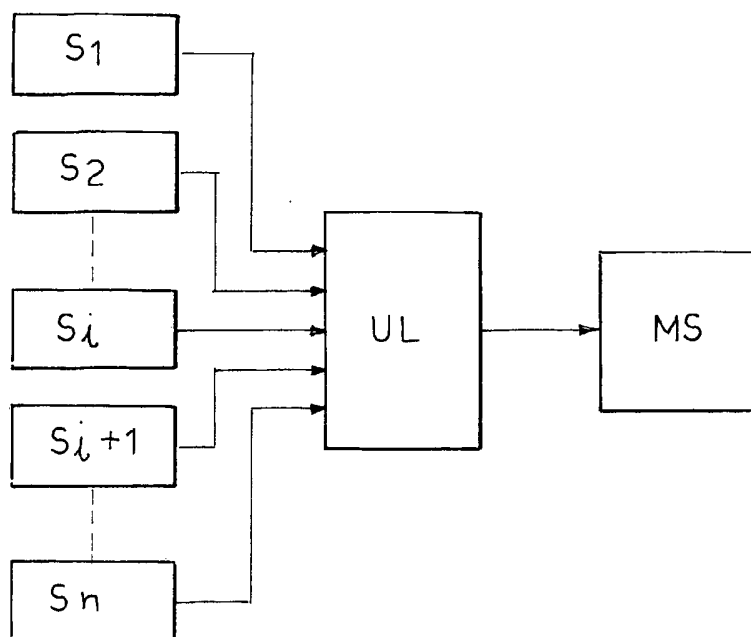
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SHELF STOCK MANAGEMENT DEVICE FOR DEPARTMENT STORES



(57) Abstract: It is described a device which allows the management of stocks of product in department stores, which includes, combined with each others, a plurality of sensors (S) - each of them being positioned beneath a product and being apt to sense the available quantity of product - and a logic unit (UL), connected to the sensors (S) and apt to activate alerting means (MS) when it finds that the quantity of product monitored by a sensor (S) falls below a preset minimum value. Usefully, the sensors are special "loading cell units" measuring the weight of products that are still setting.

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**SHELF STOCK MANAGEMENT DEVICE FOR DEPARTMENT STORES**DESCRIPTION

5 The invention refers to a device for managing the stock of a product on a department store, in particular on a shelf.

To manage the product stocks that are on the shelves of a store - and outright restoring them - has always been a sensitive problem for producers of those products and for the  
10 store managers, especially if the store is part of a big chain of department stores in which the consumers draw directly – generally from the shelves – the packages of goods they intend to buy.

In fact it has been observed that if the product packages drawn by the clients are not  
15 immediatly restored on the shelf with new packages, avoiding that the shelf (or a portion of the shelf) on which the packages are set remains empty, the customers - which are unable to find the product they are searching for - buy a product from another producer (with consequent damage for the producer of the missing product) or they buy somewhere else the product they cannot find in that store, with a damage to the owner of  
20 the store.

In order to avoid these drawbacks, it is necessary that the store personnel checks frequently the shelves, to restore the stocks of the set products.

25 Such solution is, obviously, expensive for the store manager and does not ensure that all products, especially those mostly required, are always available for customers.

Object of the present invention is a computer aided device that manages the stock on a store, allowing to remedy to the above described drawbacks.  
30

Such device has the characterising features described in Claim 1; further useful features of the invention are the objects of the dependent Claims.

An exemplary embodiment of the invention, only for presentation purposes and not  
35 exhaustive of the invention, is described below with reference to the attached drawings, in which:

- Figure 1 shows schematically a block diagram of a device according to the present invention;
- Figure 2 shows schematically a flow chart explaining, as a non exhaustive example, a possible operation of the logic unit of the device in Figure 1.
- 5 - Figure 3 shows schematically a perspective view of a shelf of a store equipped with a device according to the present invention.

In the following Figures the same items will be always identified with the same numbers.

- 10 Figure 1 shows schematically a block diagram of a device according to the present invention which includes, in combination with each others, a plurality of sensors S ( $S_1$ - $S_n$ ) – each of them is placed beneath a product and is apt to sense the product quantity – and a logic unit UL, connected to the sensors S and apt to activate alerting means MS ( $MS_1$ - $MS_n$ ) when it finds that the product quantities, monitored by the sensors S, fall  
15 below a fixed minimum value.

- Preferably the products are set on shelves (or on portions of the shelf) SC (Figure 3) and the sensors S are positioned on the shelves (or on the portions of the shelf) SC beneath each product but, without departing from the scope of the invention, when the products  
20 are set in cases or large carriers (boxes, pallets, etc.) without being positioned on the shelves the sensors S are conveniently positioned under such cases or support.

- The logic unit UL scans cyclically all the sensors S and waits for a preset time T – preferably fixed by the store manager – before repeating the cyclical scanning of all the  
25 sensors S. The period of the preset time T may vary and may be shorter in the time of the day, or in the days, in which there is (or is predicted to be) more customer affluence.

- Usefully, the sensors S are of the type known in art as “loading cell units”, they are positioned under the product to be monitored, are apt to measure the product weight, and  
30 - knowing the weight of each product package – the number of the packages that are still set.

- Usefully, the product packages set for the customers are positioned on a support and the loading cell unit S is positioned between the support and the layer of the shelf SC but,  
35 without departing from the scope of the invention, the loading cell units S can be

embodied in the shelf (or in a part of the shelf) SC appointed to receive a specific product.

Alerting means MS can be, for example, light and/or acoustic markers positioned by each shelf or gathered in a synoptic panel positioned in the warehouse or in another part of the store; alerting means MS will not be further disclosed in this document because they are known and can be easily chosen each time by a skilled person in order to comply to every specific requirement.

Usefully, each of the alerting means MS ( $MS_1$ - $MS_n$ ) is associated to one of the sensor S ( $S_1$ - $S_n$ ).

Figure 2 shows schematically a flow chart describing, as a non exhaustive example, a possible operation of the logic unit UL, belonging to the device of Figure 1, which, after an initialization step (phase 20), performs in sequence at least the following functional steps:

- it acquires (phase 21) the value sensed by a first sensor  $S_1$  and compares it (phase 22) to a first threshold value  $VS_1$ ;
- if the value sensed by the first sensor  $S_1$  is higher than the first threshold value  $VS_1$ , the logic unit UL acquires (phase 121) the value sensed by the next sensor  $S_2$  and compares it (phase 122) to another threshold value  $VS_2$ ; otherwise the logic unit UL activates (phase 23) an alerting means  $MS_1$  associated to the sensor  $S_1$  before acquiring (phase 121) the value sensed by the next sensor  $S_2$  and comparing it to the threshold value  $VS_2$  (phase 122) and, if necessary, before activating an alerting means  $MS_2$  (phase 123) associated to the sensor  $S_1$ ;
- it repeats the above described functional steps (phase 21-123) for every other sensor S ( $S_3$ - $S_n$ ) until completing recurrent scanning of all sensors S.

In Figure 2 are illustrated only the functional steps related to sensors  $S_1$ ,  $S_2$  and  $S_n$ , omitting, in order to allow a simple graphic representation, the functional steps related to the other sensor ( $S_3$ - $S_{n-1}$ ).

Figure 3 shows schematically a perspective view of a store shelf equipped with a device according to the invention; in Figure 3 are shown a sensor S, positioned between a support SUP and a shelf SC and connected by known means to the logic unit UL to which are connected the alerting means MS, realised - in the embodiment of Figure 3 - as a PC monitor.

Without departing from the scope of the invention, a skilled person can easily produce to the above mentioned device all the necessary changes and improvement, suggested by normal experience and/or by the natural technical development.

CLAIMS

1. Shelf stock management device for department store, characterised by comprising, combined each others, a number of sensors (S) – each of them being positioned beneath a product and being apt to sense the product quantity – and a logic unit (UL), connected to the sensors (S) and apt to activate alerting means (MS) when it finds that the product quantity, monitored by a sensor (S) falls below a preset minimum value.
2. Management device according to Claim 1, apt to manage stocks of products set on shelves (SC), characterised in that each sensor (S) is positioned on a shelf (SC) beneath the product to be monitored.
3. Management device according to Claim 1, apt to manage stocks of products set on portions of shelves (SC), characterised in that each sensor (S) is positioned on a portion of shelf (SC) beneath the product to be monitored.
4. Management device according to Claim 1, characterised in that the sensors (S) are “loading cell units” apt to detect the weight of the product.
5. Management device according to Claim 2, characterised in that the packages of the product displayed to the consumers are positioned over a support (SUP) and in that the sensor (S) is positioned between the support (SUP) and the layer of the shelf (SC).
6. Management device according to Claim 2, characterised in that the sensors (S) are embodied in the shelf (SC).
7. Management device according to Claim 3, characterised in that the packages of the product displayed to the consumers are positioned over a support (SUP) and in that the sensor (S) is positioned between the support (SUP) and the layer of the portion of shelf (SC).
8. Management device according to Claim 3, characterised in that the sensors (S) are incorporated into the portion of shelf.
9. Management device according to Claim 1, characterised in that the logic unit (UL) scans cyclically all the sensors (S).

10. Management device according to Claim 9, characterised in that the logic unit (UL) waits for a preset time (T) before repeating the cyclic scanning of all the sensors (S).

11. Management device according to Claim 10, characterised in that the time (T) lasts  
5 differently as a function of the present or predicted flow of customers.

12. Management device according to Claim 1, characterised in that the logic unit (UL), after an initialization step (phase 20), performs in sequence at least the following functional steps:

- 10 - to acquire (phase 21) the value sensed by a first sensor ( $S_1$ ) and to compare it (phase 22) to a first threshold value ( $VS_1$ );
- if the value sensed by the first sensor ( $S_1$ ) is higher than the first threshold value ( $VS_1$ ), to acquire (phase 121) the value sensed by a next sensor ( $S_2$ ) and to compare it (phase 122) to another threshold value ( $VS_2$ ); otherwise to activate (phase 23) an alerting means  
15 ( $MS_1$ ) associated to first sensor ( $S_1$ ) before acquiring (phase 121) the value sensed by the next sensor ( $S_2$ ), comparing it (phase 122) to the another threshold value ( $VS_2$ ) and, if necessary, activating alerting means ( $MS_2$ ; phase 123);
- to repeat the above functional steps (phases 21-123) for every other sensor S ( $S_3$ - $S_n$ ) until completing recurrent scanning of all sensors (S).

20

13. Management device according to Claim 1, characterised in that each of the alerting means ( $MS$ ;  $MS_1$ - $MS_n$ ) is associated to one of the sensors (S;  $S_1$ - $S_n$ ).

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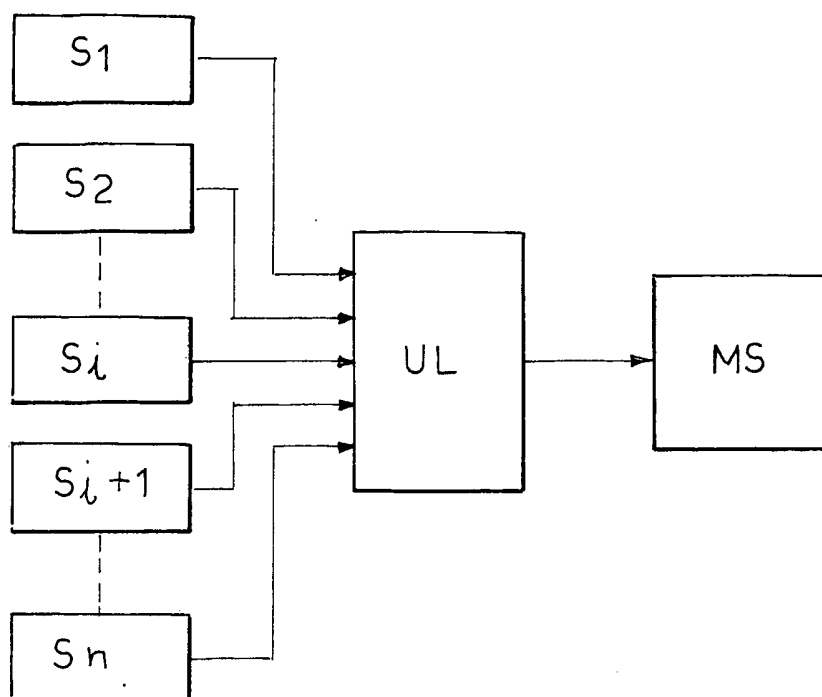


FIG. 1

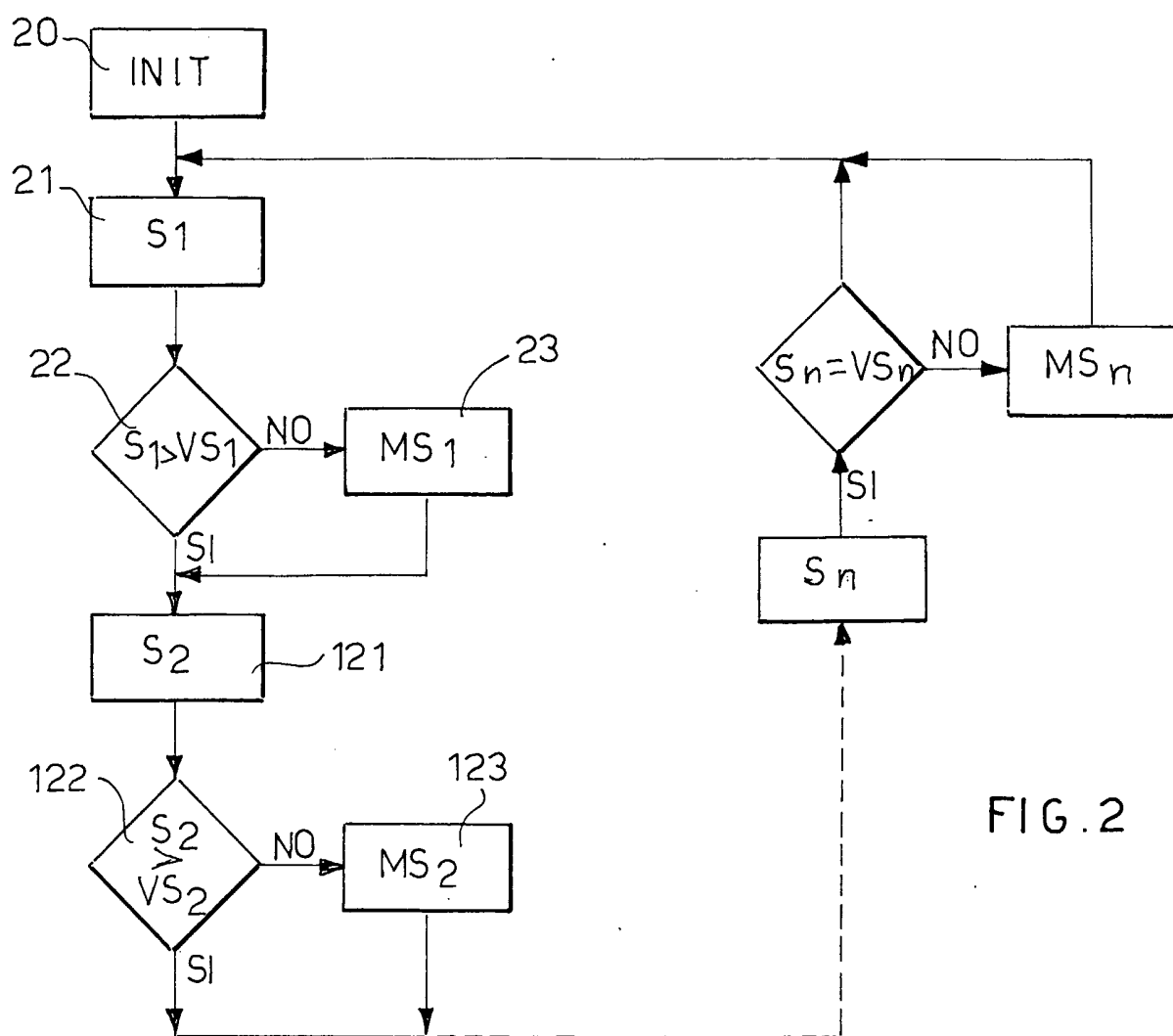
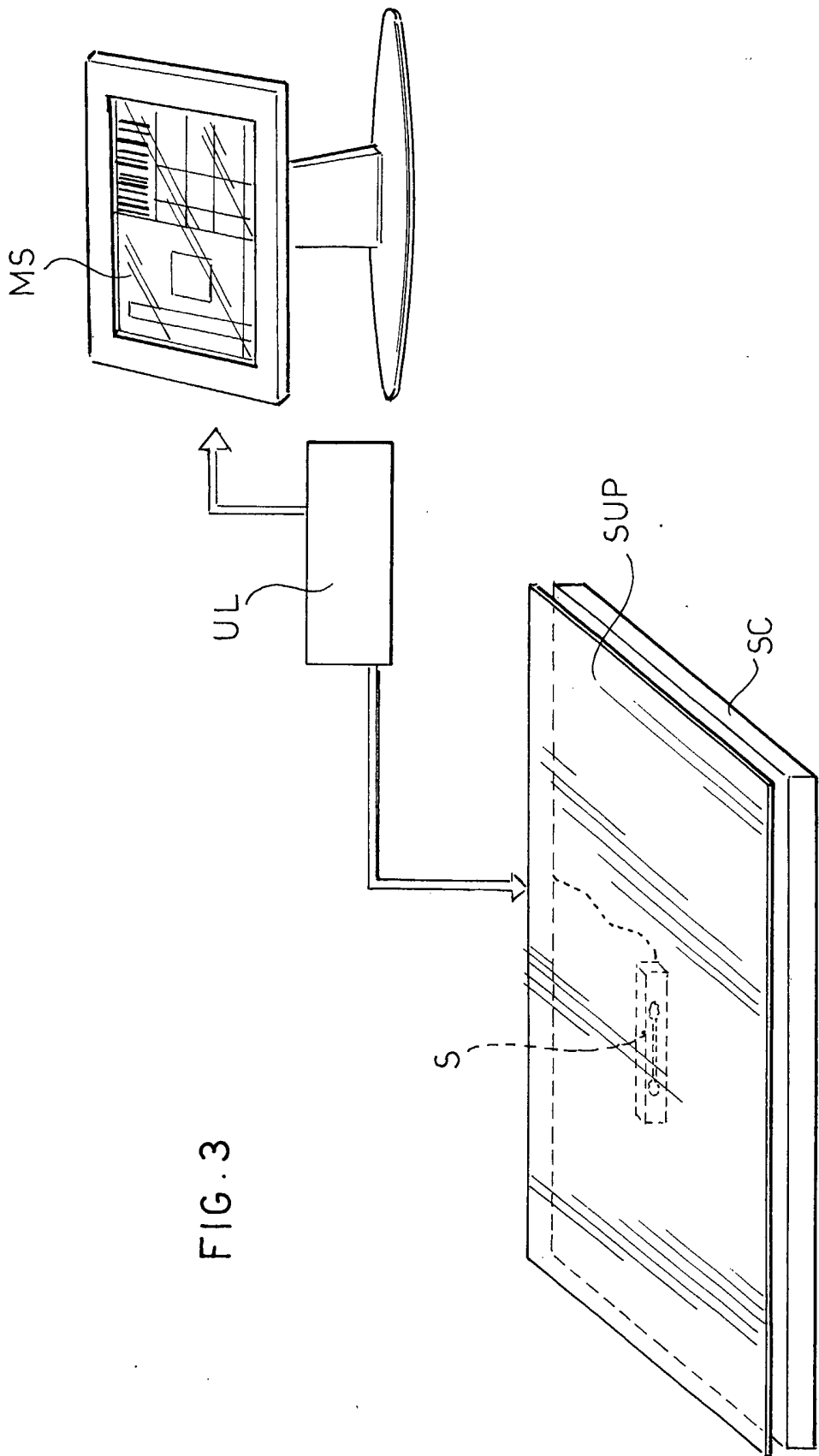


FIG. 2



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**A. CLASSIFICATION OF SUBJECT MATTER**  
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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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EPO-Internal, PAJ, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/29925 A (BINTEL SYSTEMS INC) 25 May 2000 (2000-05-25) abstract figures 1,6b,15 page 11, lines 5-14 page 14, lines 9-13 page 16, line 24 - page 17, line 11 -----	1-13
X	EP 0 733 985 A (HENLID LTD) 25 September 1996 (1996-09-25) abstract column 1, lines 5-55 -----	1-13
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☒ Further documents are listed in the continuation of box C.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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