Abstract: A method and an apparatus for collecting information (1) of marketed products in a physical point of sale provided with a consultation terminal (5) are described. The method of collecting information involves two steps, which are: the visual simulation of a barcode perceptible by a consultation terminal (5); and the capture of visual information (8) generated by the consultation terminal (5) after the completion of the first step. The apparatus for collecting information (1) of the invention is configured to allow the implementation of the method described above. Namely, the apparatus (1) is configured for visual simulation of a barcode and the subsequent capture of visual information (8) generated by the consultation terminal (5).
METHOD OF COLLECTING PRODUCTS INFORMATION AND APPARATUS FOR COLLECTING INFORMATION

[001] The present invention relates to a method and an apparatus for collecting information of products available for sale in a physical point of sale.

Description of the prior art

[002] In the commerce of goods and services, in whichever the market is - whether it is related to the branch of supermarkets, clothing stores, consumer durable goods or consulting services - in a healthy economy, all these segments have in common submission to the rules of the free market.

[003] The principle of the free market postulates that the seller of products or services is free to establish prices as it pleases so you can afford your operational costs and receive a cash surplus as profit. The same principle postulates that the buyer is also free to choose where and when to spend his money, based on the best offering prices and products.

[004] The famous law of supply and demand states that the lower the price of a merchandise, greater is the demand for the product or service. Thereby, the trader who sells lower market prices products tends to get a greater demand for their merchandises.

[005] Therefore, throughout the history of economics, where there was the commercialization of goods and services, there was interest from a seller in knowing the prices applied by its competitors.

[006] Occurs that, is not always easy to make a research of prices. The research of prices charged by a seller of products is even more difficult than the research of prices charged by service vendors. This is because; it is not rare that establishments such as supermarkets, department stores and appliance stores commercialize tens of thousands of different products all at once. On the other hand, it is very rare to find service providers that offer a larger variety than a hundred services at different prices.
[007] In the prior art, the techniques used by marketers to research competitive price are fairly rudimentary.

[008] Worldwide, the trader who wants to know the prices charged by their competitors performs this research of prices as follows: by hiring a service provider responsible to catalog manually all prices charged by products from the store competitor. This service provider is responsible to walk the aisles arranged between the gondolas comprised by the competitor stores, writing down on a piece of paper or digital form, the different names and prices of the products marketed by the shop search.

[009] This work requires a lot of time and money and, nevertheless, is prone to failure by carelessness or bad faith on the part of the operator. Notice that, the person in charge of the research of prices can lose concentration and making wrong notes or fabricate data to avoid having to scroll through all gondolas of a supermarket, just to name two of the main sources of failures resulting from this method.

[0010] In addition to the trader interested in price competition, research of prices are also carried out by research institutes responsible for the monitoring the rate of inflation, for buyers in large scale, such as restaurant chains and builders and manufacturers who want to monitor the prices applied of their products at retail.

[0011] Despite the purposes of each research of prices being different, the problems faced by these institutions are the same. There is no way to have speed, practicability and absolute reliability in price research currently held by these institutions. This is because the method used to perform these searches is very rudimentary and prone to errors.

**Objectives of the invention**

[0012] The present invention aims a simple, practical, quick, efficient and reliable method of research of prices and products information.

[0013] The present invention also aims a configured apparatus to facilitate the
collection of prices and products information available for sale at a particular point of sale.

**Brief description of the invention**

[0014] The objectives of the present invention are achieved by a method of collecting information of products available for sale on a physical point of sale equipped with a consultation terminal, which comprises the following steps:

[0015] First step: visual simulation of a barcode noticeable by the consultation terminal; and

[0016] Second step: capturing visual information generated by the consultation terminal due to the realization of the first step.

[0017] The objectives of the *present invention are also* achieved by a apparatus to collect products information available for sale in a physical point of sale, equipped with a consulting terminal, that includes a barcodes simulator device and a camera configured to capture images, wherein said simulator device is configured to visually simulate bar codes able to generate an input at the consultation terminal, this input being programmed to generate a visual response in the consultation terminal and the said camera being configured to capture the visual response displayed by the consultation terminal.

**Brief description of the drawings**

[0018] The present invention will be, hereinafter, described in more detail based on an example of execution represented in the drawings. The figures show:

[0019] Figure 1 - Reveals a perspective view of the apparatus for collecting information of the present invention disposed in front of a consultation terminal.

[0020] Figure 2 - Shows a perspective view of one of the embodiments of the apparatus for collecting information of the present invention.

[0021] Figure 3 - Shows a front view of the barcodes simulator device of the invention in its preferential embodiment of execution.

[0022] Figure 4 - Shows a perspective view of the barcodes simulator device of the
invention in its preferential embodiment of execution.

Detailed Description of the Figures

[0023] From Figure 1 of the present document is possible to notice the modus operandi of the method and apparatus of the present invention.

[0024] The apparatus of the present invention, henceforth apparatus for collecting information 1, comprises a barcodes simulator device 2 and a camera 9 configured to capture images.

[0025] The operation of the apparatus for collecting information 1 is given as follows: a professional in charge of the research of prices goes to one particular point of sales, comes near of a consultation terminal 5 in this point-of-sale and activates the apparatus 1.

[0026] At this point, is worth emphasizing that, the consultation terminals 5 are equipment increasingly popular in physical points of sale throughout the world. In countries like Brazil, for example, there is a legislation that obliges a trader to install a consultation terminal 5 at his point of sale in case he makes use of barcodes for pricing his merchandise. (See Art. 7 of Decree Nº 5903, of 09/20/2006).

[0027] For the purposes of analysis and semantic interpretation of the present specification, by "consultation terminal" means: any physical device that allows you to query prices, including, electronic cash register, present in practically all physical points of sale of relevance in business.

[0028] When activated, the apparatus 1 performs the following tasks: visually simulates a barcode noticeable to the consultation terminal 5 and, then, captures the visual information 8 generated by the said consultation terminal 5 through the use of its camera 9. The steps of visual simulation of barcodes and capture of visual information are repeated successively until the apparatus for collecting information 1 have collected all the information required to finalize the search at that particular point of sales.
For purposes of analysis and interpretation of the present report, by "barcode" means any graphical representation of numeric or alphanumeric data aimed to identify a product, including there, the traditional vertical patterns black and white code and the modern two-dimensional barcode also called QR code.

Preferably, the apparatus for collecting information is the result of combination of two separate devices: a smartphone and a barcodes simulator device.

The word "smartphone", in the present specification, should be interpreted in *latu sensu*, i.e. in the broadest appropriate sense to the interpretation of this word. More particularly, when this expression is used in the present specification, its meaning should be understood as: a cellular phone with, at least, a microprocessor and a digital camera. The expression "smartphone", in this specification, is not restricted to phones with advanced computing, touch-screen and Internet access, i.e., the meaning *stricto sensu* of that expression.

By "simulator device of barcode", on the other hand, refers to: any device apt to visually simulate a barcode able to serve as input to the optical reader, at least, a specific model of consultation terminal.

Preferably, the simulator of barcodes comprises a cold screen display associated with a microprocessor.

A cold screen display (also known as e-ink display) is an electronic display configured to allow control of the reflection and absorption of ambient light falling on this object. Unlike conventional displays, the cold screen display does not emit its own light, therefore requiring external light to get access to the content displayed on it.

Cold screen displays are well known in the prior art. Because they are more delicate to sight of their users than the traditional screens of laptops, tablets and smartphones, this type of display is generally used by electronic devices called e-book readers. One of the manufacturers of this technology is Au Optronics Corp Company,
applicant of the patent US20110299151.

[0036] The cold screen display 3 is used in preferential setting of the present invention because optical readers of the majority of consultation terminals 5 currently available on the market are incapable of decode images displayed on conventional electronic displays 5 but are able to decode images displayed on a cold screen display 3. This is because the optical readers 4 of the great majority of consultation terminals 5 are configured to emit laser beams, and to capture the reflection of these rays. It is based on the pattern of the laser beam reflected and captured by the optical reader 4 that the consultation terminal 5 reads the barcode disposed in proximity to this element. Cold screen displays 3 are able to display any kind of barcode, including the traditional code of black and white vertical patterns and the most modern two-dimensional barcodes.

[0037] Alternatively, instead of cold display screen 3, the barcodes simulator 2 can comprise a light emitting diode (LED) associated to a transmitting device of preprogrammed frequencies (an electronic microprocessor, for example).

[0038] This alternative configuration of the invention operates as follows: as stated previously, the optical 4 reader of the reading terminal 5 performs the reading of a barcode using the reflection pattern of laser beams emitted by the optical reader himself. When a laser beam crosses a barcode, it is expected that the beam is absorbed by the dark lines of the code and reflected by its white lines. Thus, what the optical reader receives after sending of the laser beam 4 is an intermittent pattern of light (on, off, on, off, on, on ...) which is immediately converted to an electronic binary pattern (1, 0, 1, 0, 1, ...) by means of a photoelectric cell. This binary pattern is then interpreted by an electronic processor comprehended by the consultation terminal 5.

[0039] The LED comprised by the alternative version of the invention is set to "fool" the optical reader 4 by emitting a flashing frequency of light which is interpreted by the optical reader 4 the same way as the reflection of a laser beam reflected by the lines
of a barcode.

[0040] In other words, the LED is configured to turn on and turn off very quickly, at a frequency equal to the frequency noticeable by the photoelectric cell of the optical reader 4.

[0041] Other configurations are also allowed for the barcodes simulator 2. Among them are:

• A conventional electronic display: for example, an LED, LCD or TFT screen, which can be the own screen 11 of the smartphone 6. At this point, note that a small portion of the consultation terminals 5 currently available on the market are endowed with optical readers 4 that can read barcodes exposed in conventional electronic displays.

• A roll of paper arranged in a similar structure to the carcass of a cassette, the paper of this roll being entirely filled with barcodes printings.

[0042] It should be noted that, in all reasonable settings to the execution of the method of the present invention, before the operator of the apparatus 1 enters into the field to conduct the research of prices, a first task of collecting barcodes should be performed.

[0043] There are several ways to collect barcodes, among them stands the following: when an establishment A wants to know the prices that the establishment B practice for the same product line marketed at their point of sales, the supermarket A provides the operator of the apparatus 1 a list with barcodes of all the products of interest. In possession of this information, the operator of the apparatus 1 goes to a consultation terminal 5, present at a point of sales of the supermarket B, and collects all information displayed by the consultation terminal 5 for each of the barcodes displayed.

[0044] This is possible, because, as a general rule, the bar codes are universal, i.e. despite the prices of the same product may vary according to the point of sale where the product is sold, its barcode remains the same for all points of sale.
Preferably, the smartphone 6 and the barcodes simulator device 2 communicate in real-time via WiFi (see Figures 3 and 4).

 Alternatively, these two elements could also communicate via: an audio plug 7 tied to an audio input 10 (see figures 1 and 2), a USB input, a Bluetooth antenna, or any other means of electronic interface.

 In the preferred configuration of the invention, the barcode simulator 2 comprises: a secondary selection button 17; a button on/off 12; a charger entry 13; a main selection button 14; a functions indicative LED 15; a indicative on/off LED 16; and a cold screen display 3 (see Figures 3 and 4).

 It should be noted that the preferred configuration of the invention, which defines a smartphone 6 in association with the barcode simulator device 2, does not limit the scope of protection of the invention. The apparatus for collecting information 1, may also be present in the following physical settings:

- two associated smartphones 6: one of them assuming the function of barcodes simulator device 2 and the other comprising a capture of visual or audio device;
- A single smartphone 6, tablet or digital book reader: each one of these elements comprising a screen or a LED able to simulate visually a barcode and a capture of visual or audio device;
- Among other possibilities.

 It should be noted that a common denominator among all these alternatives settings applicable to the invention is the manual portability of these devices.

 The manual portability of the apparatus for collecting information 1 is important, because without it, the data collection carried out by the operator of the apparatus 1 would be impracticable. For instance, the apparatus for collecting information could hardly present in the form of a computer desktop. That's because it would be unfeasible, or at least quite inconvenient to carry a desktop computer to the interior of a
supermarket or department store, install this equipment in front of a consultation terminal 5 and use the electric grid of this establishment for the energy supply used by the computer.

[0051] It is clear from the initial part of the detailed description of the figures in this specification, that the invention is not only a apparatus for collecting information 1 but also consists of a method of collecting products information available for sale in a physical point of sale provided with a consultation terminal.

[0052] This method consists of two steps, which are:

[0053] A first step, which consists of the visual simulation of a barcode perceptible by a consultation terminal 5; and

[0054] A second step, which consists in capturing visual information 8 generated by the consultation terminal 5 after the completion of the first step.

[0055] From the definition above, it is to be noted that the invention encompasses all forms of visual simulation possible for a barcode. This simulation can be performed, for example, through the use of a cold screen display 3, a conventional electronic display (v. g. LED, LCD or TFT) or a roll of paper partially or fully filled with barcodes printings.

[0056] As for the capture of visual information 8, in addition of already mentioned capture through a digital camera 9, (which can be a type of camcorder or photographic camera), the aforementioned method also includes the following alternative forms of data capture:

• Pen and Paper: in this mode, after the input generated in the first step, which consists of the visual simulation of a barcode, the operator manually write in a form or on a blank sheet of paper all the visual information 8 generated by the consultation terminal 5. The advantage of the form of execution of this method about the prior art is the fact that the prices researcher doesn’t need to move through all the aisles of a point of sale to complete his mission of collecting prices at a given point of sales.
Audio Recorder: In this mode, the operator will read aloud from the screen of the consultation terminal 5 after each visual simulation of barcodes performed. At the same time that he reads aloud the data displayed on the consultation terminal screen, his voice is recorded in an audio recorder device. At an opportune moment, the operator manually transcribe the data stored in the recording to an electronic spreadsheet, or makes use of a voice-recognition software, configured to perform this function automatically. The advantage of this form of execution of the present method about the prior art is the same as the preceding immediately configuration, i.e., the fact that the operator entrusted with the prices collection doesn't need to move through all the aisles of a point of sales to complete his mission of collecting prices at a given point of sales.

[0057] To perform the synchronization between the visual simulation of a barcode and the capture of visual information 8, the apparatus for collecting information 1 has the following possibilities: sound synchronization; visual synchronization; and manual synchronization. For each of these modes of synchronization there is a logical of collection of different information. What follows, each of the three logical of collection of information is revealed in detail:

**Sound Synchronization:**

1. Delimitation, by the researcher, of the region where it will be extracted the information. This is accomplished by manual delimitation of the region corresponding to the consultation terminal screen 5 in a video application.
2. Visual Simulation of a barcode, and timekeeping in relation to a reference (preferably, the beginning of the video performed in step 1);
3. After assimilation, by the apparatus for collecting information 1, of an audible signal corresponding to the noise produced by the machine (a "beep"), a series of frames of the consultation terminal screen 5 are captured;
4. Performing OCR in the delimited area of the captured frames, in order to
assign redundancy for data captured.

5. Comparison of data extracted from the OCR with available data in an internal memory, considered reasonable for a given product (for example, a price range considered acceptable for a toothbrush);

6. If it is not possible to capture the information, or the information captured is inconsistent with what is expected for a given product, the barcode must return to the line, to be again visually simulated in phase 2;

7. If the information has been captured correctly, pass on to the next barcode of the line to perform a new collection.

**Visual Synchronization:**

1. Delimitation, by the researcher, of the region where it will be extracted the information. This is accomplished by manual delineation of the region corresponding to the consultation terminal screen 5 in a video application;

2. Send the barcode for the apparatus 1, with the marking of time in relation to a reference (beginning of the video, preferably);

3. After assimilation, by the apparatus 1, of a frame with visual differences considerably large in relation to the last frame captured, capture a new quantity of frames after a period of pre-determined visual change, marked in relation to the reference of fixed time.

4. Completion of the OCR in the demarcated area in frames captured, in order to assign redundancy to the data captured;

5. Comparison of the data extracted from the OCR with data available in an internal memory, considered reasonable for a given product.

6. If it is not possible to capture the information, or the information captured is inconsistent with what is expected for a given product, the barcode should return to the line, to be again visually simulated in phase 2;
If the information has been captured correctly, pass on to the next barcode of the line to perform a new collection.

**Manual synchronization:**

1. Delimitation, by the researcher, of the region where it will be extracted the information. This is accomplished by manual delineation of the region corresponding to the consultation terminal screen 5 in a video application;
2. Visual simulation of a barcode, and timekeeping in relation to a reference (preferably, the beginning of the video performed in step 1);
3. After assimilation, by the researcher, of alteration in the information disclosed by the consultation terminal 5, this professional should press a button to change the barcode. This pressing is also referenced in time.
4. The apparatus 1 will then capture a predetermined number of frames, few moments before the pressing (moment at which the price is on the screen).
5. Completion of the OCR in the demarcated area in frames captured, in order to assign redundancy to the data captured;
6. Comparison of the data extracted from the OCR with data available in an internal memory, considered reasonable for a given product.
7. If it is not possible to capture an information, or the information captured is inconsistent with what is expected for a given product, the barcode should return to the line, to be again visually simulated in phase 2;
8. If it is possible to collect this information, returns to phase 2.

It is noted that, this specification approaches in a generic way the term "collecting information", rather than referring only to the expression "prices collection". This is because; other information in addition to the price of a given product can be captured in step to capture visual information 8.

Besides the price of a finished product, the consultation terminals 5, can
also inform: the name of the product, the brand, the manufacturer, the quantity, weight and volume of its contents, if the product is on sale for a limited time, the expiration date, the quantity in stock, the mode of delivery, the possible forms of payment deadline, the taxes levied on the product, among other information.

[0060] All the information listed above may be captured in the second step of the method of collecting products information of the present invention.

[0061] The method of collecting products information of the invention can also comprise the following additional steps in addition to the first and second steps revealed above.

• A third step: configured to store information caught by the second step; this third step being preferably performed through the use of an electronic memory.

• A fourth step: configured to decode the information caught by the third step.

[0062] As regards the fourth step, this operation can be performed through the use of a text-recognition software (also known as Processing Software OCR or Optical Character Recognition Software). This type of software is well-known in the prior art and its function is to convert scanned image into an electronic text file. The prior art comprises several techniques for text recognition. Among them, we can highlight the techniques disclosed by the following patent documents: US5369715 (Sharp Kabushiki Kaisha); US8249399 (International Business Machines Corporation); and US6178263 (Xerox Corporation).

[0063] After the decoding of the information performed by the fourth step, the obtained data can be displayed in a spreadsheet or in a file generated by a word processor. The organization of data in a spreadsheet or electronic text file greatly facilitates the work of the final recipient of this information.

[0064] This recipient, through a simple command on a computer keyboard can
quickly access the price of a given product; organize side by side, the prices charged by its competitor for the same products sold in their stores; know exactly what the percentage difference between average prices of their own products and the prices of competitors; among other practical possibilities of analysis and organizing data.

[0065] Thus, it is concluded that the present invention achieves the objectives that it proposes to achieve, revealing a simple, practical, fast, efficient and reliable method of research of prices and product information, also showing an apparatus for collecting information, able to facilitate the collection of prices and information of products available for sale in a certain point of sale.

[0066] Have been described an example of preferred embodiment, it should be understood that the scope of the present invention includes other possible variations, being limited only by the content of the claims attached, including the possible equivalent.
CLAIMS

1. Method of collecting information of products commercialized in a physical point of sale provided with a consultation terminal (5), characterized in that it comprises the following steps:
   first step: visual simulation of a barcode perceptible by the consultation terminal (5); and
   second step: capture of visual information (8) generated by the consultation terminal (5) as a result of the completion of the first step.

2. Method of collecting information according to the claim 1, characterized in that it comprises a third step, configured to store the information (8) captured by the second step.

3. Method of collecting information according to the claim 2, characterized in that it comprises a fourth step, configured to decode the information (8) captured by third step.

4. Method of collecting information according to the claim 2, characterized in that the third step is carried out by means of an electronic memory device.

5. Method of collecting information according to claim 3, characterized in that the fourth step is performed through the use of an OCR processing software.

6. Method of collecting information according to claim 1, characterized in that an automatic synchronization is performed between the simulated barcode and captured visual information (8).

7. Method of collecting information according to the claim 6, characterized in that the synchronization between the simulated barcode and captured visual information (8) is performed upon detection of a "beep" produced by the consultation terminal (5).

8. Method of collecting information according to the claim 6, characterized in that the synchronization between the simulated barcode and captured visual information (8) is performed by comparison of visual information detected in different frames of visual
9. Method of collecting information according to the claim 1, characterized in that the synchronization between the simulated barcode and captured visual information (8) is performed manually.

10. Apparatus for collecting information (1) of products available for sale in a physical point of sale provided with a consulting terminal (5), characterized in that it comprises a barcodes simulator device (2) and a camera (9) configured to capture images, wherein said simulator device (2) is configured to simulate visually barcodes capable of generating a consultation terminal input (5), this input being programmed to generate a visual response in consulting terminal (5) and the said camera (9) being configured to capture the visual response displayed by the consultation terminal (5).

11. Apparatus for collecting information (1) according to claim 10, characterized by being manually portable.

12. Apparatus for collecting information (1) according to claim 11, characterized in that it consists of one of the following electronic devices: a smartphone (6), a tablet or a digital book reader.

13. Apparatus for collecting information (1) according to claim 11, characterized in that it consists in the combination of two smartphones (6) communicated via: audio plug, USB, Bluetooth, electric cable or Wifi.

14. Apparatus for collecting information (1) according to claim 11, characterized in that it consists in the combination of a smartphone (6) and a simulator barcodes device (2).

15. Apparatus for collecting information (1) according to claim 10, characterized in that the said simulator barcodes device (2) comprises a cold screen display (3).

16. Apparatus for collecting information (1) according to claim 10,
characterized in that the said simulator barcodes device (2) consists of a light emitting diode associated with a emitting device of pre-programmed frequencies.

17. Apparatus for collecting information (1) according to claim 10, characterized in that the said simulator barcodes device (2) consists of a roll of paper, at least, partially filled with barcodes printings.

18. Apparatus for collecting information (1) according to claim 14, characterized in that the simulator barcode device (2) communicates with the smartphone (6) by one of the following means of communication: one audio plug (7), a USB cable, a Bluetooth connection, an electric cable or Wifi connection.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06Q30/06

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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"P" document published prior to the international filing date but not later than the priority date claimed

19/12/2014

Gardin, Alexander
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