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(54) Title: COMPUTER-IMPLEMENTED METHOD OF GRAPHIC INTERFACE WITH OPTICAL ILLUSION

(57) Abstract: Computer-implemented method comprising the steps of providing, by a screen, a product display area with at least one image of a product; providing a first and a second form made with a right or acute angle and of dimensions varying depending on the dimension of the image and positionable on opposing sides with respect to the image, so as to converge towards the image; comparing a display date of a buyer with a predefined threshold date prior to a removal date of such image from the product display area, so as to apply the first and second forms to the image when the display date is equal to or subsequent to the predefined threshold date, in order to draw the attention of the buyer to the image, by creating an optimal illusion of magnification and to have, once the image has been removed from the product display area, a lower quantity of products depicted by such image and still unsold.

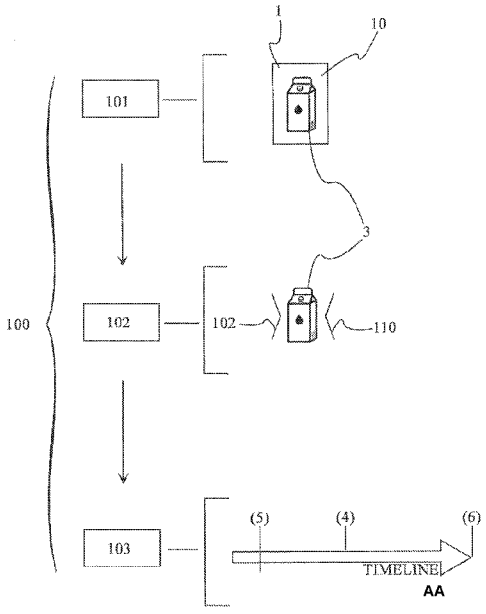

Fig. 1

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"COMPUTER-IMPLEMENTED METHOD OF GRAPHIC INTERFACE WITH OPTICAL ILLUSION"

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Description

Field of the art

The invention concerns the field of optical illusions. Even more specifically, the invention concerns a computer-implemented method of graphic interface provided by a screen on which an optical illusion of magnification, shown on such interface, of a representative image of a product being sold is generated.

State of the art

The main purpose of the *packaging design*, study of colors and shapes activities as well as advertising of a given product is aimed at making the same more attractive and stand out from other products provided by *competitors*, as well as to induce buyers to prefer them and to gain their loyalty.

It is clear that nowadays, times during which sales environments are more complex and chaotic for users, the study related to how products are presented to the customer is of great importance, starting from the *packaging* and ending with the arrangement of the products themselves on the shelves of real or virtual stores, e.g. online sales platforms.

Over the years, it was observed how human perception is essentially attracted by lively colors, by particular signs or symbols and especially by what appears bigger and more visible, which therefore takes on a particular *saliency* compared to similar objects in a given environment.

However, for reasons linked to spatial constraints in the product display area available on a real or virtual shelf, e.g. a web page in which images of products being sold are shown, it is not always possible to actually increase the dimensions of a product package or of a representative image of a product to make it stand out more. In particular, when the products being sold on a real or virtual shelf are about to be removed or replaced with a new product, because for example about to expire or, as in the case of the clothing sector, when a new collection is launched at the end of the season to replace the previous one, the same can become waste, e.g., such as expired food products for which disposal costs or, as in the case of the clothing sector,

additional storage costs must be incurred, thus reducing the space intended to new products. A solution to solve these problems and minimize the quantity of unsold products as a result of their removal from the product display area can be found in optical illusions.

In particular, an illusion formed by means of illusory geometric effects occurring within a real or virtual retail space can be defined as the altered perception of the objects therein, which perception in turn induces an altered interpretation of their actual dimensional significance. For example, in a real or virtual retail context, an illusory effect is induced by a causative object, or *trigger*, and extends its effects on another target, or object in that environment, such as for example on the *packaging* of individual products or groups of products. For example, the trigger could be the *packaging* itself of a product which, due to its characteristics, can make the space assigned to that product appear bigger than it objectively is. As an alternative, it can be an additional element of the real or virtual shelf and which triggers an illusion with respect to the perception of other objects, such as groupings of products contained therein.

Exploiting an optical illusion so as to amaze the viewer and thus generate favorable feedback to a particular product is a practice that is often observed in successful advertising and promotional campaigns. An example is the subject matter of the patent application US8458932B2 of G. SCHNUCKLE. The invention concerns an optical illusion device.

The invention is shown in the figures of the patent application as applied to a label to be affixed to a bottle, and thus to *packaging*, containing a liquid. The invention comprises a mirror element and a frame element. The mirror element has a curved reflective surface and a primary image printed in contact with the reflective surface. The frame element is spaced from the mirror element and includes a background image element positioned so as to be facing the reflective surface. The frame element further includes a transparent window which is positioned in front of the primary image, so as to provide a line of sight towards the reflective surface and the primary image. The bottle, with its liquid, thus acts as a lens between the frame element and the mirror element.

Unlike the invention of G. SCHNUCKLE, the invention presented in this context exploits the Müller-Lyer optical illusion which consists in perceiving a longer or shorter

line depending on whether it ends with the presence of two segments inclined at about +/-45° or +/-135°, thus respectively forming an angle with "*in*" configuration towards the center or "*out*" configuration towards the outside. The illusion is typically an illusion of length and, depending on the type of terminals present (*in* or *out*), the line is perceived as quantitatively longer or shorter. Actually, as in other advertising campaigns, the invention's purpose is not to amaze the buyer but rather aims at making it seem that the part between the two inclined segments is bigger, thus creating a subjective alteration of the dimensions of the space observed.

Even more advantageously, the invention has the further purpose of analyzing the impact that the application of this optical illusion to an image representative of a given product being sold within a virtual product display space may have on purchases.

Description of the invention

According to the present invention, a computer-implemented method of graphic interface for a user is achieved, comprising the step of providing, by a screen, a product display area, e.g. a virtual shelf of a virtual point of sale, such as for example a web page of an e-commerce or online sales store, wherein there is at least one image representative of a product in the product display area. Such method involves the further step of providing a first and a second form made with a right or acute angle and of dimensions varying depending on the dimension of said image. In particular, by exploiting the principle of the Müller-Lyer optical illusion, such first and second forms are positionable on opposing sides with respect to said image, so as to converge towards the image. However, the form can also have angles of a different aperture and different shape, such as a rectangular, trapezoidal or other one, so as to anyhow generate the Müller-Lyer optical illusion or other similar geometric and dimensional optical illusion, when arranged in the proximity of its counterpart. According to an aspect of the present invention, such distortion of the optical perception generated by the first and second forms is exploited to draw the attention of a user to the image representative of a product which is about to be removed from or replaced with another product on the virtual shelf. To achieve this, the method described provides the step of comparing a display date of a buyer of said image, e.g. when the buyer sees the web page of the online sales store on which the image is shown, with a predefined threshold date prior to

a predefined removal date of such image from the product display area. The threshold date and the removal date of the image from the product display area can be set, for example, while inserting the image on the virtual shelf, e.g. by means of the control panel of the online sales store. Similarly, the time distance of the threshold date from the removal date of the image can be set by the seller according to his preferences, e.g. by means of the control panel of the online sales store. Moreover, according to the invention, the first and second forms are applied to said image when the display date of the buyer is equal or subsequent to the predefined threshold date, so as to draw the attention of the buyer to the image by creating an optical illusion of magnification of the same image. This way it is possible to have, when the image has been removed from the product display area, a lower quantity of products depicted by such image and still unsold with respect to a condition in which that image is depicted without first and second forms until the predefined removal date, the number of products displayed in the product display area being equal prior to the application of the first and the second forms to the image. Advantageously, it is thus possible both to reduce the quantity of waste produced and the related disposal costs in the event that the unsold products were to be expired, e.g. food products, and to reduce the physical space occupied by the unsold products in the warehouse, so that new products can be inserted without requiring additional space in the warehouse.

According to a further embodiment of the present invention, such method comprises the step of analyzing the sales impact achieved by applying the first and second forms to an image representative of a product when displayed on the virtual shelves of a virtual point of sale.

In particular, to conduct market surveys, such analyzing step comprises the sub-steps of:

(i) Counting, by the computer application, the number of users who interacted with the image of the product over a time period prior to the application of the first and second forms; interaction means actions such as prolonged displaying for more than 5 seconds, clicking on the image for obtaining additional information on the product, selecting the image for inserting the product into the virtual cart, purchasing the product;

(ii) Counting, by the computer application, the number of users who

interacted with the image of the product over a period of time of the same duration as that of the period of point (i), but over which said first and second forms were applied to the image of the product;

(iii) outputting the comparison data between count (i) and count (ii).

The advantages provided by the present invention are clear in light of the description set forth up to now and will become even clearer thanks to the accompanying figures and the respective detailed description.

Description of the figures

The invention will be described hereunder in at least one preferred embodiment by way of example and without limitations with the aid of the accompanying figures, in which:

- FIGURE 1 shows the steps of the computer-implement method of graphic interface according to a preferred embodiment of the present invention;
- FIGURE 2 shows the further step of analyzing the computer-implemented method of graphic interface according to an embodiment variant of the present invention;
- FIGURE 3 shows a view of a preferred embodiment of the form applied to an image representative of a product to create an optical illusion of magnification.

Detailed description of the invention

The present invention will now be illustrated only by way of example and without limitations or obligations, resorting to the figures which illustrate some embodiments related to the present inventive concept. In particular, during the following description and as shown in FIG. 1, a computer-implemented method 100 of graphic interface for a user and through which it is possible to generate an altered optical perception of an image shown to the user by an optical interface, e.g. a screen, is presented, thus creating an optical illusion of magnification of such image according to the principle of Müller-Lyer optical illusion. To achieve this result, the method 100 comprises the step 101 of providing, by a screen, a product display area 1, e.g. a virtual shelf of a virtual point of sale 10, such as for example a web page of an e-commerce site or online sales store, wherein there is at least one image 3 representative of a product. In particular, when a user views the product display area 1, e.g. the web page of the online sales store, the image representative of a product can be, for example, arranged within a list of images

or within a grid of images each representative of the product for sale. Such method further provides the step 102 of providing a first and a second form 110 made with a right or acute angle and of dimensions varying depending on the dimension of said image. In particular, the currently deemed best embodiment of the first and second forms 110 is illustrated in FIG. 3, in which the first and second forms 110 are positionable on opposing sides with respect to said image 3, so as to converge towards the image, e.g. like arrowheads. This way, by exploiting the principle of Müller-Lyer optical illusion, when a user views the product display area 1, the first and second forms create an optical illusion of magnification on the image 3, thus making the product it represents stand out. According to an aspect of the present invention, such distortion of the optical perception generated by the first and second forms 110 is exploited to draw the attention of a user to the image 3 representative of a product which is about to be removed from or replaced by another product on the virtual shelf, e.g. when a product is about to expire or, as in the case of the clothing sector, at the end of a season when the collection, e.g. winter collection, is replaced by the summer one. To achieve this result, the method 100 comprises the further step 103 of comparing a display date 4 of the image 3 by a user with a predefined threshold date 5 prior to a predefined removal date 6 of such image 3 from the product display area 1, to apply the first and second forms 110 to the image 3 when the display date 4 is equal or subsequent to the predefined threshold date 5. In particular, the display date 4 of a user corresponds to the date on which a potential buyer views the product display area, e.g. when he views the web page of an online sales store on which the image 3 is shown. Such display date 4 can be, for example, stored within a server by means of a counter counting the visits of the web page in which the image representative of a product is shown, which counter stores the display date of the image when the user visits the web page, for example. Moreover, the predefined threshold date 5 and the predefined removal date 6 of the image can be set during the step of inserting the image 3 into the virtual shelf, e.g. by means of the control panel of the online sales store. In particular, the predefined threshold date 5 can be set at a time distance predefined prior to the predefined threshold date 6, e.g. days, weeks, etc., so as to make the image 3 stand out for a predefined time period and reach as many buyers as possible during the time period between the threshold date 5 and the

removal date 6 of the image from the product display area. A solution is thus provided able to increase the sales of the product shown by such image highlighted by the first 102 and second forms 110 with respect to a condition in which such image is depicted without the first and second forms 110 until the predefined removal date 5, the number of products displayed in the product display area being equal prior to the application of the first and second forms 110 to the image 3. In particular, thanks to the increase in sales deriving from such solution, it is possible both to reduce the quantity of waste produced and the related disposal costs in the event that the unsold products were to be expired, e.g. food products, and to reduce the physical space occupied by the unsold products in the warehouse, e.g. such as in the clothing sector, thus being able to insert new products without requiring additional space in the warehouse. According to a further preferred embodiment of the present invention, to make said image 3 stand out even more in said product display area 1, the color, shades of colors and lighting dynamics, e.g. lighting of the first and second forms with flashing or intermittent frequency, and/or the *patterns* selected for the form can be various depending on the product to be advertised and to the virtual shelf on which the image 3 is shown.

According to a further preferred embodiment of the present invention, the form can also be superimposed in transparency on said image 3, in order to generate an optical illusion also when several images of the same product are arranged adjacent to one another in said product display area, in order to generate an optical illusion which makes the group of images appear to be more numerous.

According to an embodiment variant of the present invention, as shown in FIG. 3, such method 100 also comprises the further step 104 of analyzing the sales of a product depicted by said image 3 highlighted by the first 102 and second 110 forms, so as to be able to compare the sales results with the products depicted by images without forms. In particular, to achieve this result, such analyzing step comprises the sub-steps of: (i) counting, by the computer application, the number of users who interacted with the image of the product over a period prior to the period of application of the first and second forms (e.g. 1 week before application), through actions such as clicking on the image or icon of the product to obtain additional information, inserting the product into the cart, purchasing the product or even a prolonged viewing of more than 5 seconds;

(ii) counting the number of users who interacted with the image of the product over a period corresponding to the period of application of the first and second forms (e.g. 1 week of application). (iii) The data collected is sent to a computer application which compares it with existing databases (e.g. similar products or seasonal products).

Lastly, it is clear that changes, additions or variants obvious for the technician of the field can be made to the invention described up to now, without thereby departing from the protection scope provided by the accompanying claims.

EXPERIMENTAL RESULTS

Tests were conducted using a retail shelf to show that it is possible to alter the perception of the space on the shelf assigned to an item. A distortion of the optical perception based on the principle of Müller-Lyer optical illusion was generated in three experiments, of which the second experiment (total sample of 400 subjects, N1= 120; N2= 180; N3 = 100) will be described hereunder in detail, by examining the intensity of the illusion relating to specific areas of a retail display cabinet by using points - purchasing material and packaging design. The experimental tests were also extended outside the lab in which the three previous tests were carried out, with a field experiment which showed that such distortion of the optical perception applied to the retail display cabinets is correlated with increased sales.

EXPERIMENT

Different products belonging to different product categories were used during the second experiment, using real images of the six products (see MDA hereunder). Categories used consist of undifferentiated products, essential goods and impulse purchases, for which two products were tested in each category. Each participant was exposed to a series of three images in a random position relative to each other. Participants ranked the images in terms of the portion of shelf space occupied on the screen within 1 minute. More in particular, the task consisted in selecting, in a given triplet, the image in which the product occupied:

1) the largest space and 2) the smallest one. Participants could also answer that they did not see any difference between the images. The experiment was conducted online by using the Google Forms platform. Overall, 180 subjects (55% women; MAge =31.49; SD=11.71) participated in the online experiment and were randomly assigned

to six groups, one for each product, thus 60 people per category.

RESULTS

A non-parametric statistical analysis was carried out on the ranking expressed by the participants, in terms of the portion of shelf space occupied within the display cabinets compared. The null hypothesis on the equality of the mid-ranks associated with the three experimental conditions (><, NONE and <>) was refused for all three categories and for all six products examined according to a Page's Ordered Alternative Test (Page, 1963; Sawilowsky and Fahoome, 2005, Gibbons and Chakraborti, 2003, p.463).

For all three categories examined, a monotonically decreasing trend was found in the mid-ranks of the ordered sequence "><, NONE and < >". The results were as follows:

1) for the "undifferentiated products" category [L=783; $p<0.01$; measured effect size (i.e. standardized L; cf. Peng and Chen, 2015): Ls=5.75;

IC 95% for standardized L =5.75±1.96=(3.79, 7.71)];

2) for the "essential goods" category [L=802; $p<0.01$; measured effect size: Ls=7.49; IC 95% for standardized L =7.49±1.96=(5.53, 9.45)].

3) for the "impulse purchases" category [L=771; $p<0.01$; measured effect size: Ls=4.66; IC 95% for standardized L =4.66±1.96=(2.70, 6.62)].

The analyses carried out at the level of single product provide significant, consistent and robust results (see MDA hereunder).

MDA

Experimental procedure and stimulus

Participants signed an informed consent form before participating in the experiment, which was therefore voluntary. No compensation was offered. Before being included, each subject confirmed: a) the presence of normal visual acuity (natural or corrected with glasses/contact lenses), b) not to currently (or in the past) suffer from ophthalmological diseases or neurological diseases affecting the visual system, c) and the absence of any form of dyschromatopsia. The individual experimental session lasted up to 1 minute. The images were shot in a local supermarket, using real product displays. Arrowhead forms were made in collaboration with a supplier of points of sales fittings. Following the pre-test, it was decided on dimensions of the form 2.5 cm thick and 16 cm high. Each product was photographed in three different conditions: with

inward arrowhead forms (><), without forms (NONE) and with outward arrowhead forms (<>). The number of containers involved ranged from 4 to 6 and the portion of linear space occupied ranged from 30 to 70 centimeters. The number of containers was not changed from the real environment. The images were shown in triplets with a random order of appearance. Consistent and highly significant results of a monotonically decreasing trend in the mid-ranks of the ordered sequence "><, NONE and < >" was found for all products.

Series of triplets used in the second experiment and results at product level undifferentiated Product 1 (sale)

6 containers (2 stacked rows of 3); 36 cm wide x 30 cm high [L=385; $p<0.01$; measured effect size (i.e. standardized L; cf. Peng and Chen, 2015): Ls=3.23; 95% CI for standardized L =3.23±1.96=(1.27, 5.19)].

Undifferentiated product 2 (dish detergent)

6 containers (1 row); 53 cm wide x 20 cm high

[L=398; $p<0.01$; measured effect size (i.e. standardized L; cf. Peng and Chen, 2015): Ls=4.91; 95% CI for standardized L =4.91±1.96=(2.95, 6.87)].

Essential goods 1 (lentils)

8 containers (2 stacked rows of 4); 30 cm wide x 20 cm high [L=408; $p<0.01$; measured effect size (i.e. standardized L; cf. Peng and Chen, 2015): Ls=6.20; 95% IC for standardized L =6.20±1.96=(4.24, 8.16)].

Essential goods 2 (cookies)

3 containers (1 row); 60 cm wide x 30 cm high

[L=394; $p<0.01$; measured effect size (i.e. Standardized L; cf. Peng and Chen, 2015): Ls=4.39; 95% IC for standardized L =4.39±1.96=(2.43, 6.35)];

Impulse purchase (chips)

4 containers (1 row); 70 cm wide x 22 cm high

[L=385; $p<0.01$; measured effect size (i.e. Standardized L; cf. Peng and Chen, 2015): Ls=3.23; IC 95% for standardized L =3.23±1.96=(1.27, 5.19)];

Impulse purchase (snack)

4 containers (1 row); 46 cm wide x 18 cm high

[L=386; $p<0.01$; measured effect size (i.e. Standardized L; cf. Peng and Chen,

2015): Ls=3.36; IC 95% for standardized L =3.36±1.96=(1.40, 5.32)].

CLAIMS

1. Computer-implemented method (100) of graphic user interface, comprising the steps of:

- providing (101), by a screen, a product display area (1)

e.g. a virtual shelf of a virtual point of sale (10), wherein there is at least one image (3) representative of a product in the product display area (1);

- providing (102) a first and a second form (110) made with a right or acute angle and of dimensions varying depending on the dimension of said image (3) and positionable on opposing sides with respect to said image (3), so as to converge towards the image (3);

- comparing (103) a display date (4) of a buyer of said product related to said image (3) with a predefined threshold date (5) prior to a removal date (6) of such image from the product display area (1), so as to apply the first (102) and second (110) forms to said image (3) when the display date (4) is equal to or subsequent to the predefined threshold date (5) in order to draw the attention of the buyer to the image (3), by creating an optical illusion of magnification and to have, once the image (3) has been removed from the product display area (1), a lower quantity of products depicted by such image (3) and still unsold with respect to a condition in which that image is depicted without first and second forms (110) until the predefined removal date (5) of the image (3) from the product display area (1), the number of products displayed in the product display area being equal prior to the application of the first and the second forms (110) to the image (3).

2. Method (100) according to preceding claim 1, **characterized in that** said form (110) can be made of various colors, color shades, lighting dynamics and/or *patterns* to best be able to make said image (3) stand out in said display area (1).

3. Method (100) according to any one of the preceding claims, **characterized in that** said first (102) and second (110) forms are of a convergent shape, such as trapezoidal or rectangular, so as to anyhow generate the Müller-Lyer optical illusion or other similar geometric and dimensional optical illusion, when they are placed in the proximity of one another and the image (3) being interposed.

4. Method (100) according to any one of the preceding claims,

characterized in that said form (102, 110) can also be superimposed in transparency on said image (3), in order to generate an optical illusion when several images of the same product are arranged adjacent to one another in said product display area (1).

5. Method (100) according to any one of the preceding claims, **characterized by** comprising the further step (104) of analyzing the sales of a product depicted by said image (3) highlighted by means of the first (102) and second (110) form; said further analysis step (104) comprising the sub-steps of: (i) counting the interactions of users over a period prior to the application period of the first (102) and second (110) forms, interactions mean: a) clicking on the image or icon of the product; b) inserting the product into the cart and

c) purchasing of the product; (ii) counting the users over a period corresponding to the application period of the first (102) and second (110) forms and, (iii) outputting the comparison data between count (i) and count (ii).

6. Method (100) at least according to preceding claim 5, **characterized in that** said analyzing step (104) allows to automatically analyze the sales of a product (3) autonomously, thus avoiding requiring advanced cash accounting technologies, and further performing an A/B test between the pre-application step and that of effective application of the first and second forms along different steps of the purchasing process.

7. Method (100) at least according to preceding claim 5, **characterized in that** said computer application is adapted for producing a summary of the sales of a product depicted by said image (3) highlighted by means of the first and second forms (110) over the period monitored and for making a comparison with existing databases and/or with previously entered data related to the sales without using said first and second forms (110).

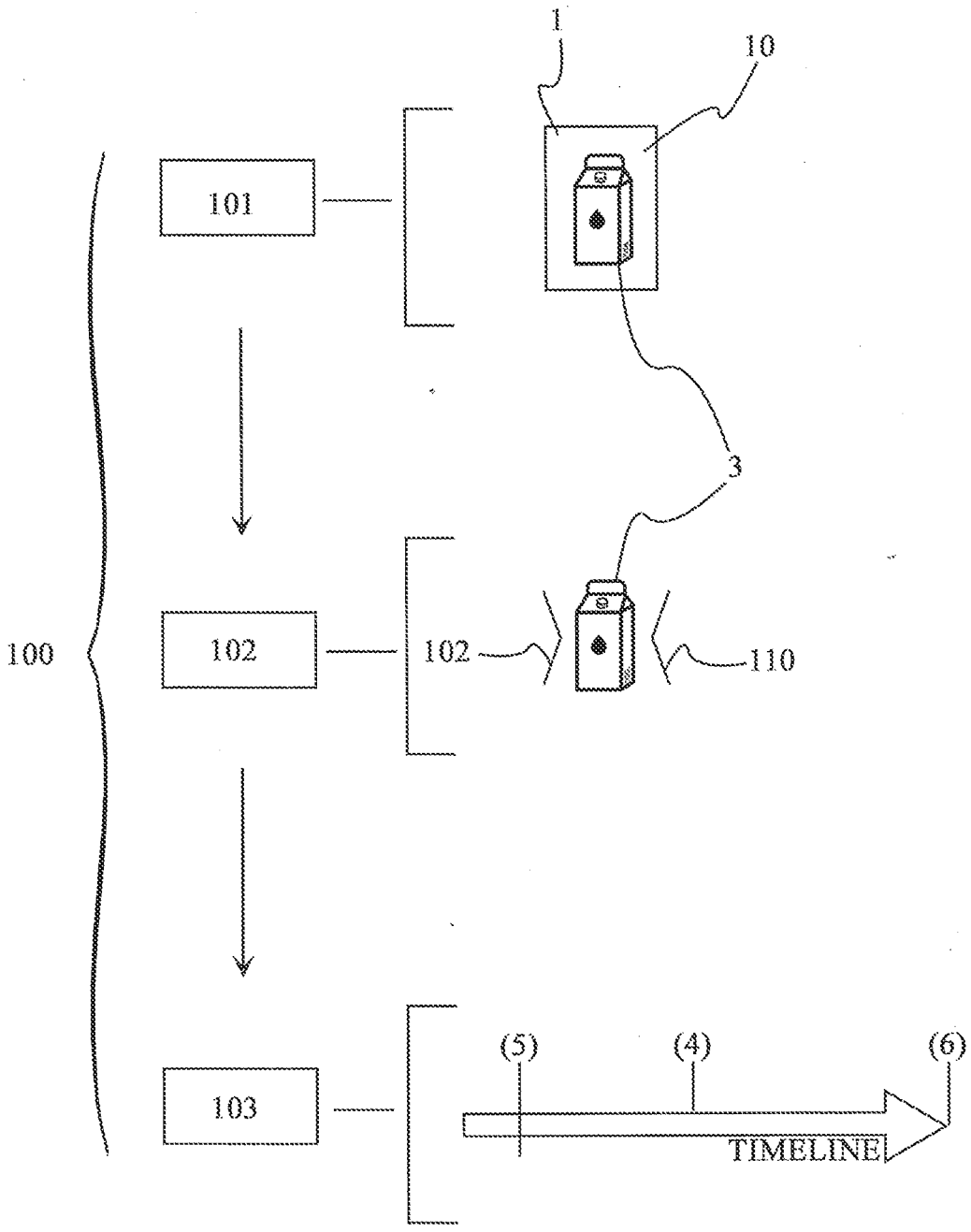

Fig. 1

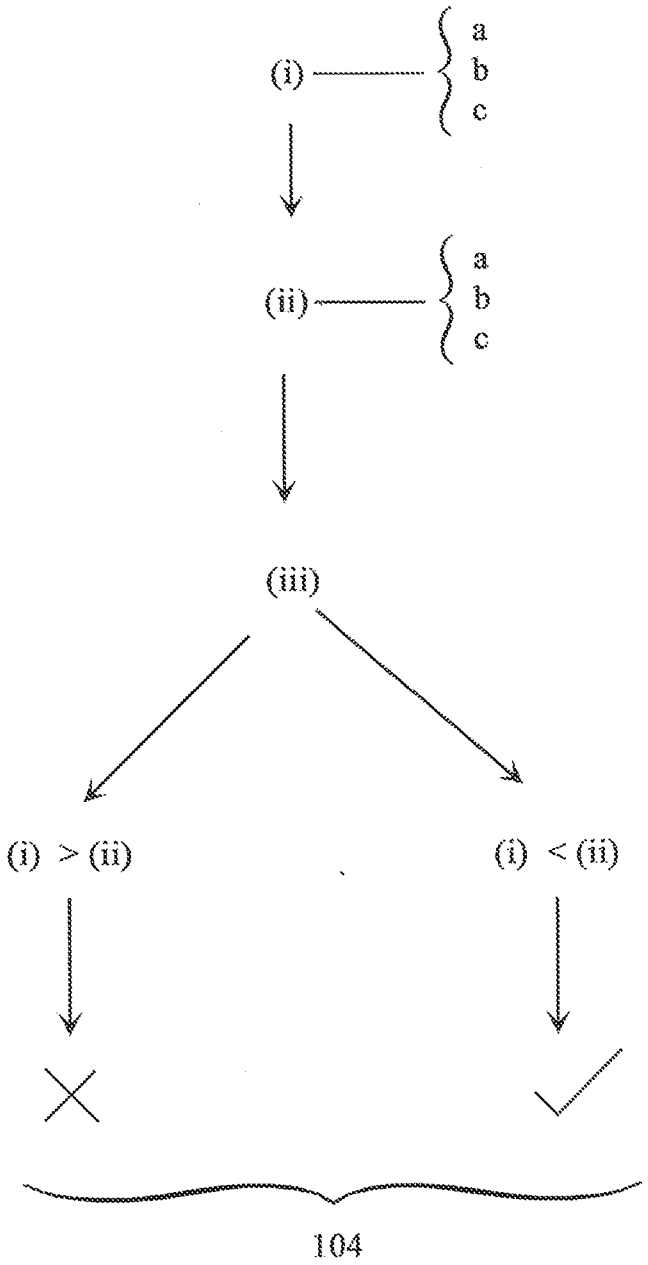

Fig. 2

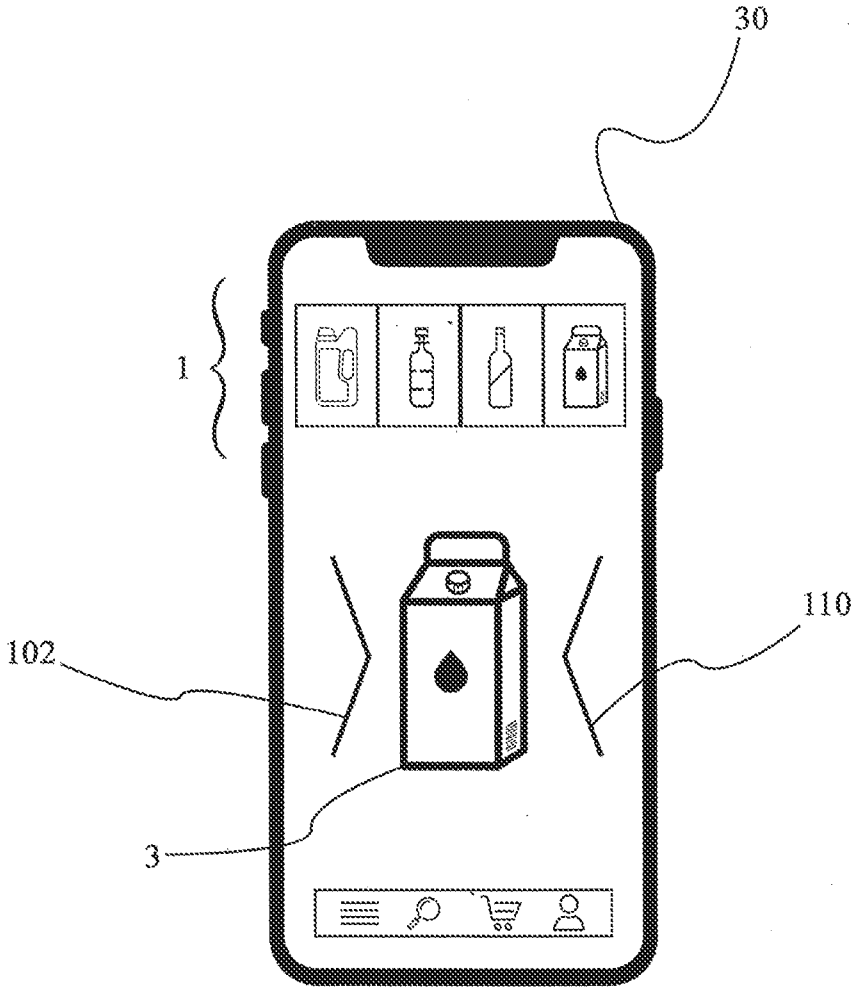

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2024/058981

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06Q30/0601
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2019/272557 A1 (SMITH KEVIN [US] ET AL) 5 September 2019 (2019-09-05) the whole document -----	1-7
A	US 2013/311340 A1 (KRISHNAN SARIKA [US]) 21 November 2013 (2013-11-21) the whole document -----	1-7

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
5 November 2024	13/11/2024

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2024/058981

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2019272557 A1	05-09-2019	NONE	
US 2013311340 A1	21-11-2013	NONE	