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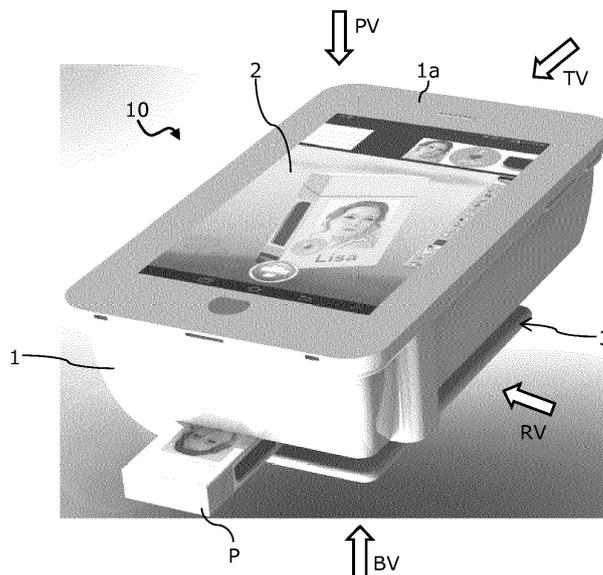
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(54) **HANDHELD PRINTER**

(57) The present invention pertains to an handheld printer (10), comprising a housing body (1) including a handhold (4) for a user to carry the printer (10) in his/her hands; a guiding bracket (3) attached to a back surface (1b) of the housing body (1), the guiding bracket (3) forming a feed channel between the back surface (1 b) of the housing body (1) and an inner wall of the guiding bracket (3) running from a top end to a bottom end of the housing body (1); at least one first printing device (6a) arranged within the housing body (1) and having a printhead extending at least partially from the back surface (1 b) of

the housing body (1); a user input device included in a front surface (1a) of the housing body (1) having a user interface (2) configured to receive user input commands via the user interface (2); and a printer controller (7a) arranged within the housing body (1) coupled to the user input device and the at least one first printing device (6a), the printer controller (7a) being configured to output printing control signals to the at least one first printing device (6a) on the basis of the user input commands input to the user input device.



**Fig. 1**

## Description

**[0001]** The present invention pertains to a handheld printer, particularly for imparting printed images on the side surfaces of consumer goods packages made from cardboard or similar materials.

**[0002]** For advertising and promotional purposes, it may be desirable for a manufacturer of consumer goods to individualize the packaging and shipping containers of those consumer goods. Even more so, possibilities for customers to personalize consumer goods packaging with specific design, patterns or other customizable images would highly enhance consumer satisfaction and purchase experience. For example, consumer goods packages such as packages for smokeable products like cigarettes or cigarillos may be altered in their visual appearance according to the customers' preferences.

**[0003]** Conveying customizable printings, labels or similar visual markings to three-dimensional objects, specifically at point-of-sale locations, is a daunting task. For example, document US 6,312,124 B1 discloses a handheld inkjet printing mechanism for printing selected images on a solid hard or semi-flexible body. Document WO 2015/027229 A1 discloses a portable printer for the personalization of toothbrushes. Document US 6,577,922 B2 discloses a method for personalizing a product at a point-of-sale by a customer. Document US 2013/0152506 A1 discloses a dynamic product personalization system.

**[0004]** Specifically for producing individualized consumer goods packages by printing customized images, designs or patterns on the outer surface of the packages, document EP 2 153 412 B1 proposes an apparatus for providing a container with an individually customized surface design.

**[0005]** However, improved solutions for packaging customization systems are needed which are easy to use by an operator, failsafe and rapid in their manner of operation. Moreover, such systems should not require extensive maintenance, should be easy to set up for an operator and should provide cost effective individualization of packages for consumer goods. Therefore, according to an aspect of the present invention a handheld printer comprises a housing body including a handhold for a user to carry the printer in his/her hands. A guiding bracket is attached to a back surface of the housing body, the guiding bracket forming a feed channel between the back surface of the housing body and an inner wall of the guiding bracket running from a top end to a bottom end of the housing body. At least one first printing device is arranged within the housing body. The first printing device has a printhead which extends at least partially from the back surface of the housing body. A user input device is included in a front surface of the housing body and has a user interface which is configured to receive user input commands. A printer controller arranged within the housing body is coupled to the user input device and the at least one first printing device. The printer controller is

configured to output printing control signals to the at least one first printing device on the basis of the user input commands to the user input device.

**[0006]** One idea of the invention is to provide a possibility to personalize consumer goods packages, such as cigarette or electronic cigarette packages, with custom-made graphics, patterns, designs, images and/or text by using a portable printer. The portable, handheld printer may be designed with dimensions such as length, height, width and sufficiently low weight so that it can be conveniently held by a user in one or both hands, thus being readily and easily portable. The handheld printer may be equipped with an electrical energy storage such as for example accumulators or one-way batteries, thus obviating the need for cables and wires. This aids in providing sufficient flexibility for the printer to be portable and operable without an external stationary power supply nearby.

**[0007]** The handheld printer may be dimensioned to accommodate packages of different sizes in the printing channel so that the printer is flexibly usable for a plurality of applications for different consumer goods and/or various types of packs. The handheld printer may be equipped with a user interface enabling an operator to use the printer to an extent that lets them print customized designs, patterns and/or images on consumer goods packages with effectiveness, efficiency and satisfaction on their own.

**[0008]** The handheld printer is mechanically robust, fail-secure and fail-safe, thereby reducing the need for extensive maintenance and increasing the dependability of the printer.

**[0009]** According to an embodiment of the handheld printer, the handheld printer may further comprise at least one conveying device which is arranged in the feed channel and which is configured to convey an object to be imprinted by the handheld printer from the top end to the bottom end of the housing body through the feed channel. In one embodiment, the at least one conveying device may be arranged within the inner wall of the guiding bracket. In this regard, one embodiment may include a resiliently biased pressure roller configured to press against the object to be imprinted fed through the feed channel. The resiliently biased pressure roller may in particular be configured to keep the object to be imprinted in contact with the at least one first printing device while being fed through the feed channel. This advantageously provides precise control over the printing process without the user having the worry about exact positioning of the object to be imprinted. It simplifies the handling process of the printer, while maintaining accurate and predictable printing results to be achieved.

**[0010]** According to a further embodiment of the handheld printer, the housing body may be integrally formed with the guiding bracket. This provides for a smooth and compact appearance of the printer, increasing mechanical durability and stability.

**[0011]** According to another embodiment of the hand-

held printer, the guiding bracket may comprise a substantially planar support member aligned in parallel to the back surface of the housing body and a spacing member protruding in a substantially orthogonal angle from a side edge of the support member. In that respect, the spacing member may be affixed to the back surface of the housing body in one embodiment, thereby defining a height of the feed channel corresponding to the protrusion height of the spacing member. With the guiding bracket formed in that manner, the dimensions of the feed channel may be advantageously adjusted to the dimensions of the objects to be imprinted. Moreover, the printing and conveying components of the printed which are generally vulnerable to unintended contact by the user, intrusion of dust and debris or mechanical shock are shielded within the feed channel by the angularly formed guiding bracket.

**[0012]** According to yet another embodiment of the handheld printer, at least one second printing device may be arranged within an inner wall of the spacing member of the guiding bracket. This advantageously enables the printer to print two adjacent side surfaces of an object to be imprinted, such as a cigarette package, at once, thereby reducing the amount of iterations needed to print designs, graphics, patterns and/or images on multiple side surfaces of the object. In particular, to imprint all six side faces of a package having cuboid shape, only three iterations of the printing process using the handheld printer are needed.

**[0013]** According to another embodiment of the handheld printer a plurality of first printing devices may be arranged in series within the housing body. The first printing devices may each have printheads extending at least partially from the back surface of the housing body with staggered offsets along the extension of the feed channel. The advantage of such a multi-printhead printer is the ability to print on side surfaces of packages of varying size without having to resort to movable printheads which might be prone to mechanical failure, especially when the printer is subject to unintended concussion or vibration during use, and without having to resort to expensive printheads with an extension over the whole desired printing width.

**[0014]** According to another embodiment of the handheld printer, the printer may further comprise at least one registration sensor arranged in the guiding bracket or in the back surface of the housing body, the at least one registration sensor being configured to register a position of an object to be imprinted within the feed channel. In this respect, the printer controller may be coupled to the at least one registration sensor in one embodiment, being configured to control the at least one first printing device on the basis of sensor signals generated by the at least one registration sensor. Using registration sensors advantageously enables the printer to enhance printing precision and control over the conveyance of the object to be imprinted through the feed channel. Specifically, the printer may flexibly adapt to any package dimensions for

packages inserted in the feed channel by dynamically determining the position and extension of the packages. Furthermore, the information provided by the registration sensors may advantageously be used by the printer controller to control any conveying devices within the feed channel to hold an already imprinted package at the outlet of the feed channel in a convenient, yet safe position for the user to manually remove the package from the printer.

**[0015]** According to another embodiment of the handheld printer, the printer may further comprise an electrical energy storage device arranged within the housing body and configured to provide the at least one first printing device, the user input device and/or the printer controller with electrical energy. Not having to provide electrical energy via wiring or power cables enhances the flexibility of the handheld printer and removes potential hazards during unattended use of the printer by operators.

**[0016]** According to a further embodiment of the handheld printer, the user interface may comprise a keyboard and/or a display, particularly a touchscreen display. The user interface may advantageously be ruggedized for fail-secure and fail-safe usage by operators, thereby enabling the printer to be employed in potentially unattended point-of-sale locations which are free to use for operators.

**[0017]** According to a further embodiment of the handheld printer, the printer may further comprise a slidable guide latch arranged within the back surface of the housing body and configured to slidably adjust the inlet width of the feed channel for an object to be imprinted. The provision of such a latch provides visual and tactile guidance to a user, advantageously reducing the risk of unintended and accidental maloperation by a user of the printer when manually inserting a consumer goods package, such as a cigarette package, into the feed channel.

**[0018]** The invention will be explained in greater detail with reference to exemplary embodiments depicted in the drawings in which:

Fig. 1 schematically illustrates a perspective view of a handheld printer according to an embodiment of the invention;

Fig. 2 schematically illustrates a plan view from a front side on the handheld printer of Fig. 1;

Fig. 3 schematically illustrates a sectional view through the backside of the handheld printer of Fig. 1;

Fig. 4 schematically illustrates a cutaway drawing in perspective view of the handheld printer of Fig. 1;

Fig. 5 schematically illustrates another perspective view of the handheld printer of Fig. 1 from the backside;

Fig. 6 schematically illustrates a plan view from the top side on the handheld printer of Fig. 1;

Fig. 7 schematically illustrates a plan view from the right hand side on the handheld printer of Fig. 1; and

Fig. 8 schematically illustrates a partial view from the right hand side on the handheld printer of Fig. 1.

**[0019]** Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations may be substituted for the specific embodiments shown and described without departing from the scope of the present invention.

**[0020]** Fig. 1 illustrates a perspective view of a handheld printer 10 from a top-front perspective, while Fig. 5 illustrates a perspective view of the handheld printer 10 from a top-backside perspective. The hollow arrows in Fig. 1 generally indicate different views which are subsequently illustrated in Figs. 2, 3, 6, 7 and 8. PV indicates a plan view from the front side, TV a plan view from the top side, RV a view from the right hand side and BV a plan view from the backside of the printer 10 in Fig. 1. Fig. 2 shows the front side view, Fig. 3 the backside view, Fig. 6 the top side view and Figs. 7 and 8 details of the right hand side view. Finally, Fig. 4 illustrates a cutaway drawing of the handheld printer 10 from a backside perspective with the housing body and the guiding bracket of the printer 10 being drawn transparent to illustrate the components within the printer 10.

**[0021]** The handheld printer 10 comprises a housing body 1 with a front surface 1a and a back surface 1b on a generally opposite side the front surface 1a. The front surface 1a of the housing body 1 is facing a user during normal, i.e. intended use of the printer 10. To that end, the housing body 1 includes a handhold 4 for a user to carry the printer 10 in his/her hands. The handhold 4 may be integrally formed with the housing body 1 which may in turn be made from injection molded plastics or resin for example. The handhold 4 may be ergonomically designed to fit a user's hand to provide a comfortable grip for a user.

**[0022]** Attached to the back surface 1b of the housing body 1, a guiding bracket 3 forms a feed channel between the back surface 1b of the housing body 1 and an inner wall of the guiding bracket 3. The guiding bracket 3 may for example be integrally formed with the housing body 1 as well. The guiding bracket 3 may comprise a substantially planar support member 3a aligned in parallel to the back surface 1b of the housing body 1. The support member 3a is held in a spaced apart position from the back surface 1b of the housing member 1 by virtue of a spacing member 3b which protrudes in a substantially orthogonal angle from a side edge of the support member 3a. The spacing member 3b may be affixed to the back surface 1b of the housing body 1. As can be best seen from Fig. 6, the spacing member 3b defines a height H of the feed channel that corresponds to the protrusion height of the spacing member 3b.

**[0023]** The feed channel runs from a top end to a bot-

tom end of the housing body 1. As can be best seen from the illustration of Fig. 7, the feed channel is designed to receive a consumer goods package of generally cuboid shape, such as a cigarette package P. The package P is manually inserted at an inlet on the top side of the printer 10 in an insertion direction I and is conveyed through the feed channel until it may be retrieved by a user again at an outlet on the bottom side of the printer in a retrieval direction R. To convey the package P within the feed channel, the printer 10 may comprise at least one conveying device 9 arranged in the feed channel. For example, there may be several conveying devices 9 spaced apart within the inner wall of the guiding bracket 3, enabling a handover between subsequent conveying devices 9 the further the package P travels within the feed channel. The conveying devices 9 may for example be resiliently biased pressure rollers that are configured to press against the package P. By way of friction, the pressure rollers 9 keep the package P in contact with the backside surface 1b of the housing body while the package P is travelling through the feed channel.

**[0024]** In the back surface 1b, at least one first printing device 6a is arranged within the housing body 1. For example, there may be several first printing devices 6a which are arranged in series within the housing body 1 in the back surface 1b. Each of the printing devices 6a may have a printhead extending or protruding at least partially from the back surface 1b of the housing body 1. A package P travelling through the feed channel is pressed against the first printing devices 6a by way of the conveying devices 9 so that the printheads may be in contact with a side surface of the package P. The first printing devices 6a may further comprise conventional printing components such as ink tanks, thermal transfer rollers and the like, so that designs, patterns, text or other printing images may be imparted on the package P by the printheads. For example, the printing devices 6a may include laser printing or inkjet printing technology with a resolution of for example 600 dpi. The first printing devices 6a may be arranged with staggered offsets along the extension of the feed channel so that eventually each region of the side surface of the package P in contact with the printheads may be imprinted along the feed channel.

**[0025]** The printer 10 further includes a printer controller 7a which is arranged within the housing body 1. The printer controller 7a may for example comprise a microcontroller storing an operating system, firmware and/or other software for operating the various electronic components of the printer 10 on a read-only memory. The printer controller 7a is configured to output printing control signals to the first printing devices 6a, thereby controlling, coordinating and synchronizing the first printing devices 6a to impart coherent and tiled printing images on the package P. Preferably, the printer controller 7 stores a design library for an operator to choose from design components to be printed on the package P.

**[0026]** In order to print on two adjacent side surfaces

of a cuboid package P at once, the printer 10 may further comprise second printing devices 6b - similar in construction and printing mechanism to the first printing devices 6a - which are arranged in an inner wall of the guiding bracket 3, preferably in an inner wall of the spacing member 3b. The printheads of the second printing devices 6b may be facing inward towards a package P transferred past the second printing devices 6b in order to impart printing images on a surface of the package P under control of the printer controller 7a.

**[0027]** A slidable guide latch 5a may be slidably held in a sliding channel 5b in the back surface 1b of the housing body 1. The slidable guide latch 5a may provide a movable side wall of the feed channel opposite to the side wall provided by the inner wall of the support member 3b. The slidable guide latch 5a may be used to adjust the inlet width W of the feed channel for a package P to be imprinted. With the provision of the guide latch 5a, packages P with cuboid shape of various sizes may be handled by the printer 10. For example, the feed channel may be designed to receive packages P of a width of up to 110 mm, a length up to 110 mm and a height of up to 30 mm. Of course, other dimensions for the feed channel may be implemented as well, depending on the desired maximum sizes of objects to be imprinted.

**[0028]** The printer 10 may comprise various registration sensors in order to register a position of a package P to be imprinted within the feed channel. The printer 10 may for example comprise a line of first registrations sensors 8a lined up in the back surface 1b of the housing body 1 along the feeding direction of the package P. The first registrations sensors 8a are configured to track a conveying location of the package P within the feed channel. Additionally, the printer 10 may comprise second registrations sensors 8b arranged in a horizontal line along the inlet of the feed channel, registering the lateral and longitudinal dimensions of any package P inserted in the feed channel. Alternatively or additionally, more registrations sensors may be included in the back surface 1b of the housing body 1 of components of the guiding bracket 3.

**[0029]** The registrations sensors may for example comprise optical sensors, contact sensors, ultrasonic sensors, light barriers, registration mark readers or similar devices. All registrations sensors 8a, 8b may output sensor signals which are input to the printer controller 7a which in turn may be configured to control the first and/or second printing devices 6a, 6b on the basis of the received and evaluated sensor signals.

**[0030]** The printer 10 may further comprise an electrical energy storage device 7b, such as an accumulator or a replaceable battery, which is arranged within the housing body 1. The electrical energy storage device 7b may be coupled to all electronic components within the printer 10 and may provide electrical power for the operation of the components.

**[0031]** The printer 10 includes a user input device included in the front surface 1a of the housing body 1. The

user input device may include a user interface 2, such as a keyboard and/or a display, for example a touch-screen display. The user interface 2 is configured to receive user input commands which are conveyed to the printer controller 7a which in turn is configured to output the printing control signals to the first and/or second printing devices 6a, 6b on the basis of the user input commands input to the user input device. The user input device may include further components such as various pushbuttons 2a, for example power switches or volume sliders, or input/output ports 2b such as USB ports, memory card slots or interface for charging cords. The user input device may in particular allow the operator of the printer to choose design components to be printed on a package P from a design component library stored in the printer controller 7a or a memory accessible by the printer controller and user input device.

**[0032]** The user input device may generally resemble a tablet computer which may be connectable to the housing body 1 by means of a socket integrated into the housing body 1. Operating system information OS may be displayed on the user interface 2, such as application information, home buttons, timing information or other icons and widgets. For example, the user input device may run an operating system such as iOS, Android, Cyanogen, Tizen, Ubuntu Mobile, Firefox or any similar mobile operating system.

**[0033]** The user interface 2 may for example display drag & drop content in a display bar DB that may be selected by a user, such drag & drop content being available from a design component library as previously explained. The drag & drop content may be previewed in a preview image PV on the screen and then edited by use of digital paint tools displayed in a paint dialogue bar TB, such as recoloring tools, re-sizing tools, cropping tools, rotating tools or formatting tools. The user interface 2 may display a three-dimensional graphical representation of the package with an envisioned look after printing. A print button PB may be displayed when the user is done with customizing the printing model and wants to initiate the printing process.

**[0034]** Then, the user interface 2 may display instructions for the user to insert a package P in the inlet on the top side of the printer 10. The package P will be automatically pulled in through the conveying devices 9 and will be imprinted by the various printing devices 6a, 6b. The package P will then be fed to the bottom side of the feed channel where it will be held in place by the conveying devices 9 until it is pulled out manually by the user again. One or two side surfaces of the package P may be printed at a time. If other side surfaces are to be imprinted, the package P may need to be re-inserted in the feed channel. The user interface 2 may display instructions to the user on how to rotate and insert the package P correctly so that the right side surfaces will be printed in the desired orientation of the printing images.

**[0035]** In the foregoing detailed description, various features are grouped together in one or more examples

or examples with the purpose of streamlining the disclosure. It is to be understood that the above description is intended to be illustrative, and not restrictive. It is intended to cover all alternatives, modifications and equivalents. Many other examples will be apparent to one skilled in the art upon reviewing the above specification.

## Claims

### 1. A handheld printer (10), comprising:

a housing body (1) including a handhold (4) for a user to carry the printer (10) in his/her hands; a guiding bracket (3) attached to a back surface (1 b) of the housing body (1), the guiding bracket (3) forming a feed channel between the back surface (1b) of the housing body (1) and an inner wall of the guiding bracket (3) running from a top end to a bottom end of the housing body (1); at least one first printing device (6a) arranged within the housing body (1) and having a print-head extending at least partially from the back surface (1b) of the housing body (1); a user input device included in a front surface (1 a) of the housing body (1) having a user interface (2) configured to receive user input commands via the user interface (2); and a printer controller (7a) arranged within the housing body (1) coupled to the user input device and the at least one first printing device (6a), the printer controller (7a) being configured to output printing control signals to the at least one first printing device (6a) on the basis of the user input commands input to the user input device.

### 2. The handheld printer (10) according to claim 1, further comprising:

at least one conveying device (9) arranged in the feed channel and configured to convey an object (P) to be imprinted by the handheld printer (10) from the top end to the bottom end of the housing body (1) through the feed channel.

### 3. The handheld printer (10) according to claim 2, wherein the at least one conveying device (9) is arranged within the inner wall of the guiding bracket (3).

### 4. The handheld printer (10) according to one of the claims 1 and 2, wherein the at least one conveying device (9) comprises a resiliently biased pressure roller configured to press against the object (P) to be imprinted fed through the feed channel.

### 5. The handheld printer (10) according to claim 4, wherein the resiliently biased pressure roller (9) is configured to keep the object (P) to be imprinted in

contact with the at least one first printing device (6a) while being fed through the feed channel.

### 6. The handheld printer (10) according to one of the claims 1 to 5, wherein the housing body (1) is integrally formed with the guiding bracket (3).

### 7. The handheld printer (10) according to one of the claims 1 to 6, wherein the guiding bracket (3) comprises a substantially planar support member (3a) aligned in parallel to the back surface (1 b) of the housing body (1) and a spacing member (3b) protruding in a substantially orthogonal angle from a side edge of the support member (3a).

### 8. The handheld printer (10) according to claim 7, wherein the spacing member (3b) is affixed to the back surface (1 b) of the housing body (1), thereby defining a height (H) of the feed channel corresponding to the protrusion height of the spacing member (3b).

### 9. The handheld printer (10) according to one of the claims 7 and 8, further comprising:

at least one second printing device (6b) arranged within an inner wall of the spacing member (3b).

### 10. The handheld printer (10) according to one of the claims 1 to 9, comprising a plurality of first printing devices (6a), the plurality of first printing devices (6a) being arranged in series within the housing body (1) and having printheads extending at least partially from the back surface (1b) of the housing body (1) with staggered offsets along the extension of the feed channel.

### 11. The handheld printer (10) according to one of the claims 1 to 10, further comprising:

at least one registration sensor (8a; 8b) arranged in the guiding bracket (3) or in the back surface (1 b) of the housing body (1), the at least one registration sensor (8a; 8b) being configured to register a position of an object (P) to be imprinted within the feed channel.

### 12. The handheld printer (10) according to claim 10, wherein the printer controller (7a) is coupled to the at least one registration sensor (8a; 8b) and configured to control the at least one first printing device (6a) on the basis of sensor signals generated by the at least one registration sensor (8a; 8b).

### 13. The handheld printer (10) according to one of the claims 1 to 12, further comprising:

an electrical energy storage device (7b) arranged within the housing body (1) and configured to provide the at least one first printing device (6a), the user input device and/or the printer controller (7a) with electrical energy.

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**14.** The handheld printer (10) according to one of the claims 1 to 13, wherein the user interface (2) comprises a keyboard and/or a display, particularly a touchscreen display.

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**15.** The handheld printer (10) according to one of the claims 1 to 14, further comprising:

a slidable guide latch (5a) arranged within the back surface (1b) of the housing body (1) and configured to slidably adjust the inlet width (W) of the feed channel for an object (P) to be imprinted.

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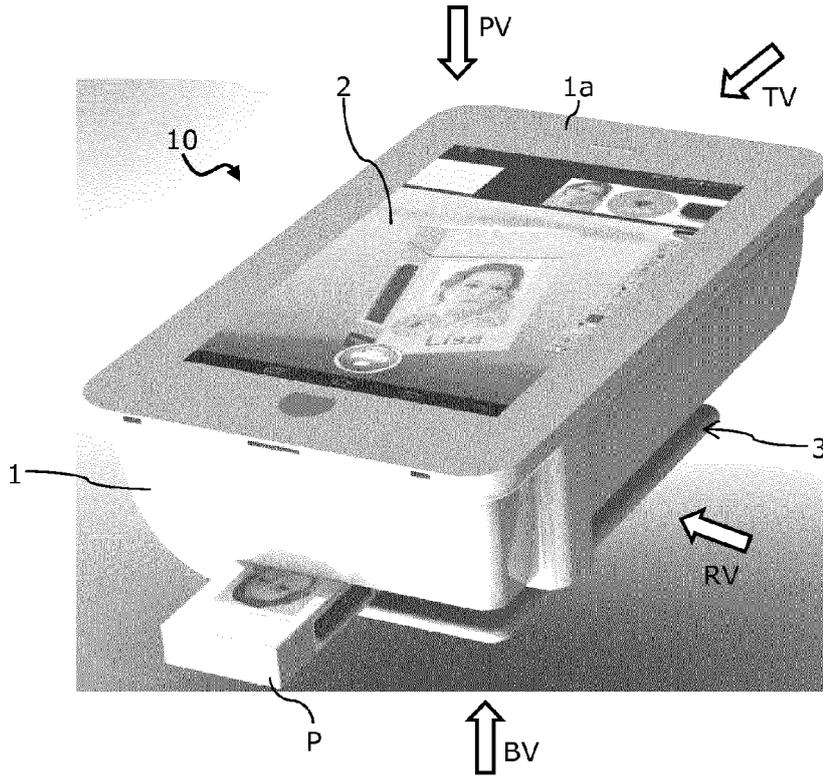
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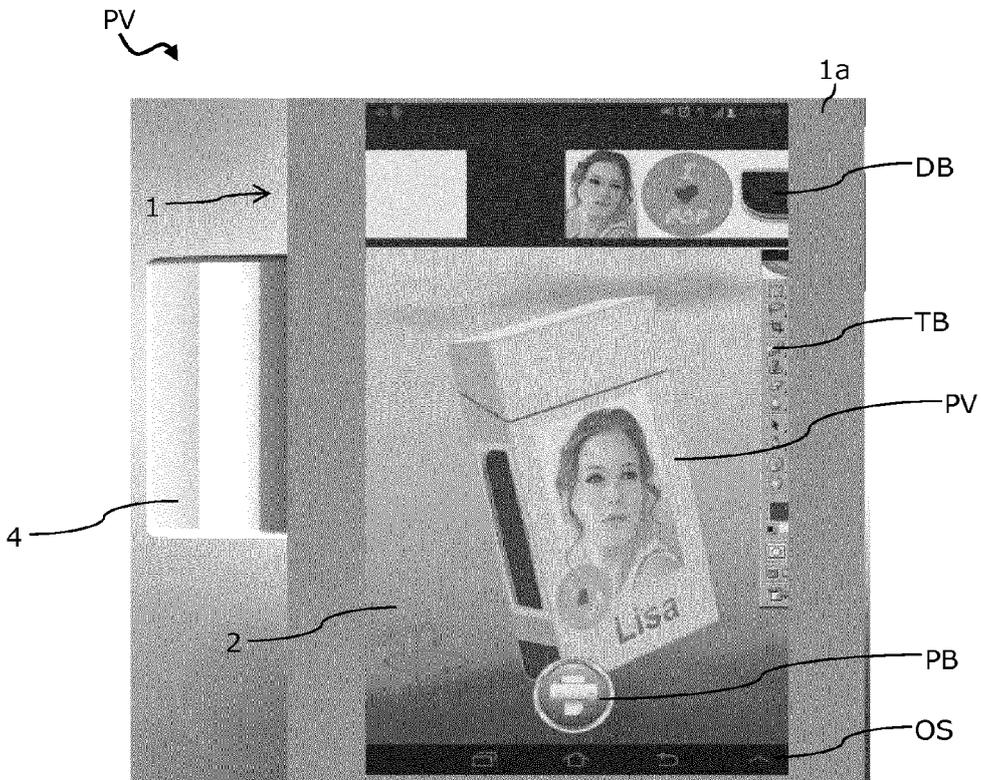
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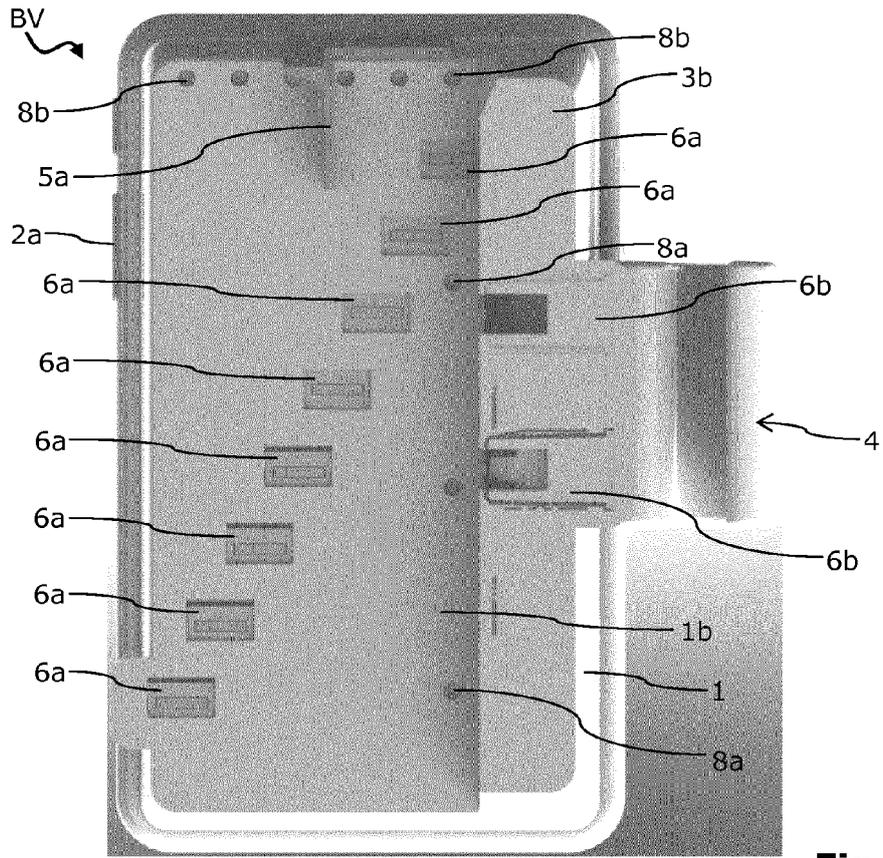
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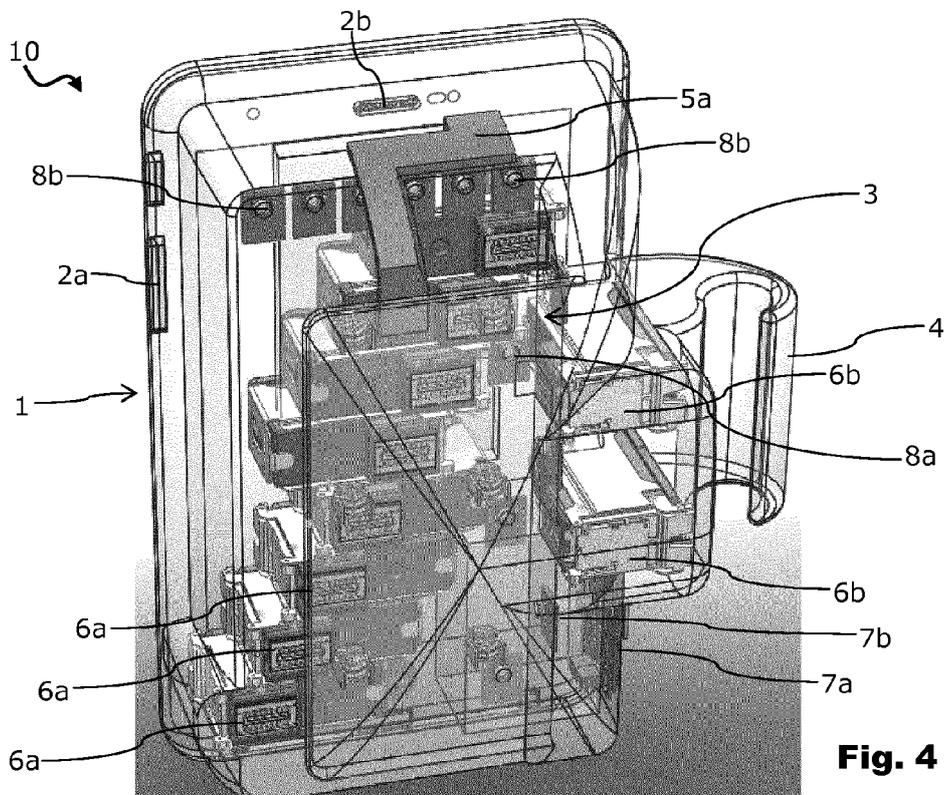
**Fig. 1**



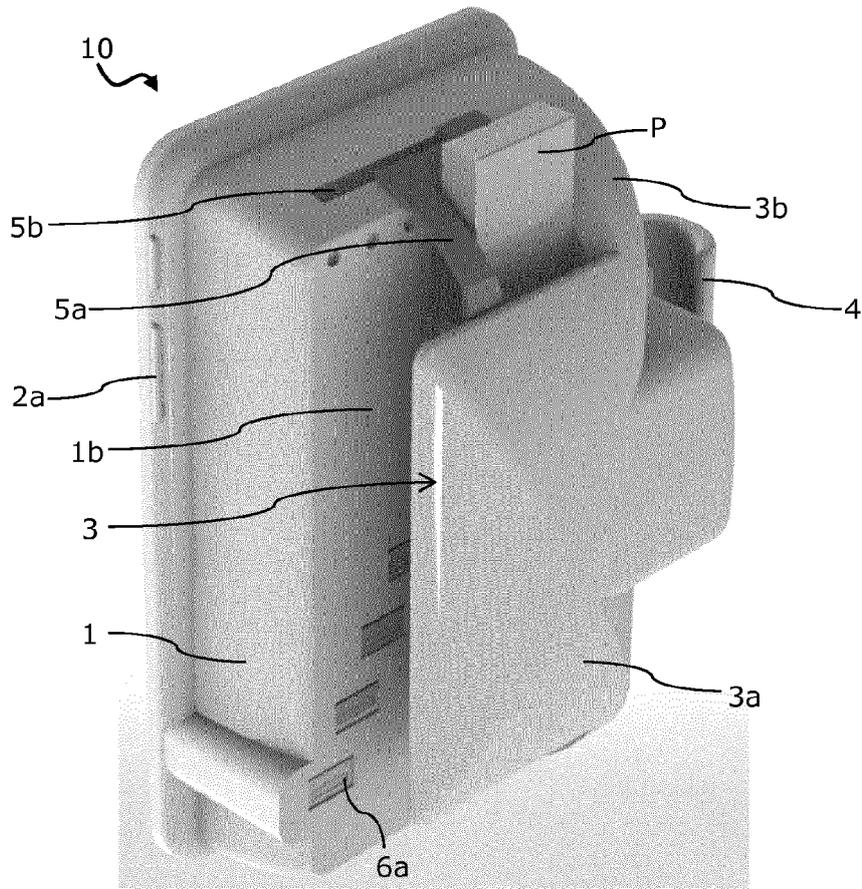
**Fig. 2**



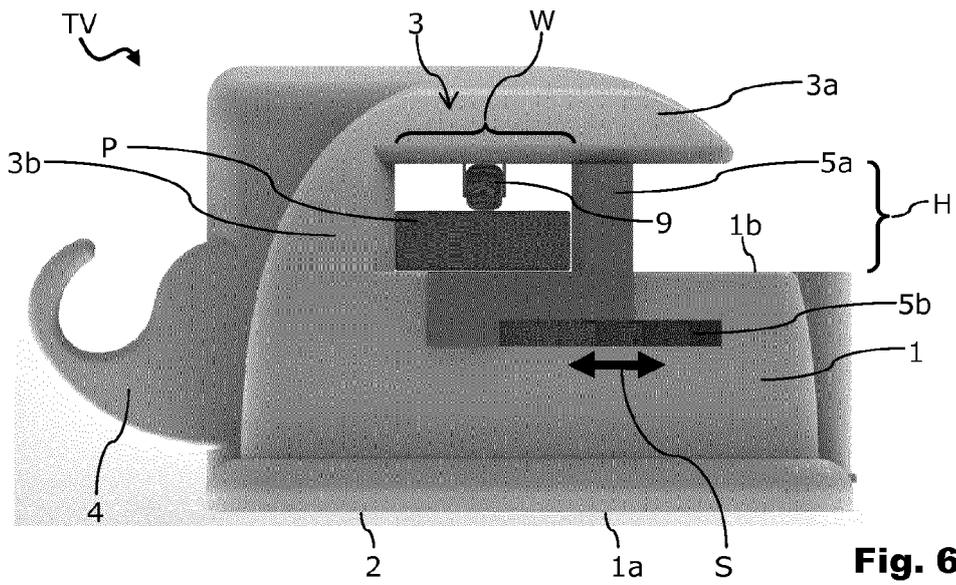
**Fig. 3**



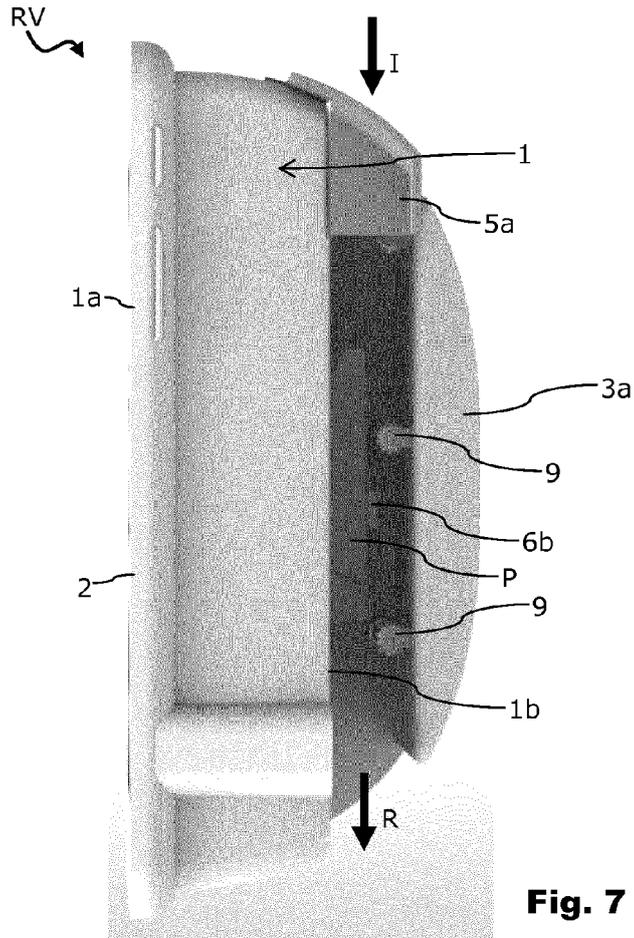
**Fig. 4**



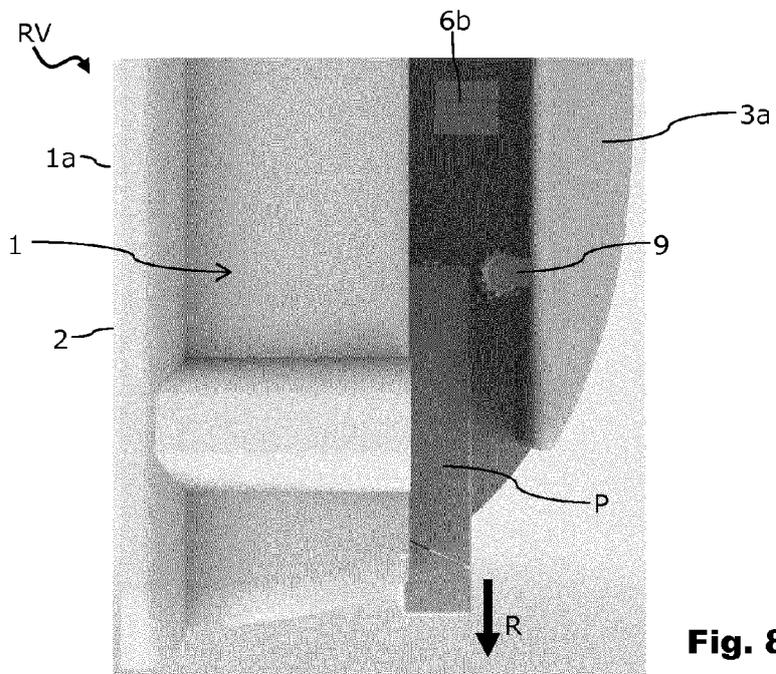
**Fig. 5**



**Fig. 6**



**Fig. 7**



**Fig. 8**



EUROPEAN SEARCH REPORT

Application Number  
EP 15 17 8087

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2010/298028 A1 (SILVERBROOK KIA [AU]) 25 November 2010 (2010-11-25) * paragraph [0027]; figures 1,9,10 * -----	1-15	INV. B41J3/36 B41J3/28 B41J3/407
A,D	EP 2 153 412 B1 (PHILIP MORRIS PROD [CH]) 3 July 2013 (2013-07-03) * paragraph [0033]; claim 1; figures 1,7,13 * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			B41J
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>4 February 2016</b>	Examiner <b>Wehr, Wolfhard</b>
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 03/02 (P04C01)

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

EP 15 17 8087

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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