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(54) **HANDHELD PRINTER**

(57) The present invention pertains to a handheld printer (10), comprising a housing body (1), a feed channel (3) formed through the housing body (1), the feed channel (3) having an inlet for inserting an object (P) to be imprinted into the feed channel and an outlet for retrieving the imprinted object (P) from the feed channel (3), at least one first printing device arranged within a first inner wall of the feed channel (3) in the housing body (1) and having a printhead configured to print onto an object (P) to be imprinted fed through the feed channel (3), a user input device provided at the housing body (1) and having a user interface (2) configured to receive user input commands via the user interface (2), and a printer controller arranged within the housing body (1) coupled to the user input device and the at least one first printing device, the printer controller 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.

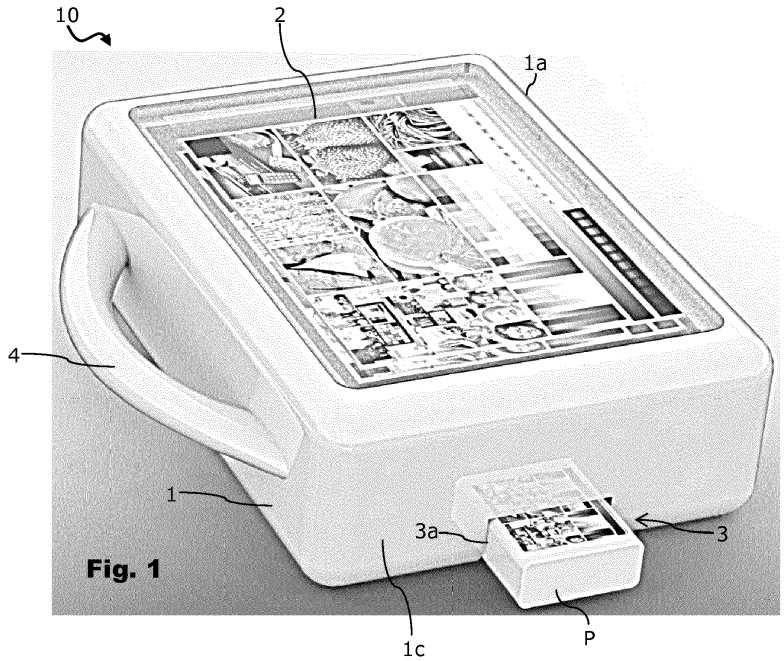


Fig. 1

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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.

[0006] Therefore, according to an aspect of the present invention a handheld printer comprises a housing body with a feed channel formed through the housing body. The feed channel includes an inlet for inserting an object to be imprinted into the feed channel and an outlet for retrieving the imprinted object from the feed channel. At least one first printing device is arranged within a first inner wall of the feed channel in the housing body and includes a printhead configured to print onto an object to be imprinted fed through the feed channel. A user input device is provided at the housing body and includes a user interface configured to receive user input commands via the user interface. 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.

[0007] 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.

[0008] The handheld printer may be dimensioned to accommodate packages of different sizes in the feed 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.

[0009] 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. Particularly advantageous is the provision of a feed channel formed through the housing body so that both the printing devices within the feed channel as well as an object conveyed through the feed channel during printing are protected against humidity, dust or other possibly intruding objects from the outside. Moreover, the printing process is entirely performed within the inside of the housing, thereby reducing the risk of unwanted interference of a user with the printing process which could negatively impact the printing results or, even worse, damage the printer components. The printing and conveying components of the printer which are generally vulnerable to unintended contact by the user, intrusion of dust and debris or mechanical shock are advantageously shielded within the feed channel.

[0010] According to an embodiment of the handheld printer, the printhead of the at least one first printing device may be spaced apart from the object to be imprinted by a predefined distance, which is preferably in the range between 0.1 mm and 3 mm. In this range, neither physical contact between the printhead and the surface may occur, nor spraying effects, which would otherwise blur the imprinted images.

[0011] According to another 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 inlet to

the outlet through the feed channel. In one embodiment, the at least one conveying device may be arranged within the inner wall of the feed channel. 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 first inner wall of the feed channel 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. Moreover, the distance between the printhead and the surface of the object to be imprinted upon may be exactly controlled and may in particular be kept constant, for example in the range between 0.1 mm and 3 mm.

[0012] According to a further embodiment of the handheld printer, the housing body may include a handhold for a user to carry the printer in his/her hands. In some embodiments, such a handhold may be integrally formed with the housing body. This provides for a smooth and compact appearance of the printer, increasing mechanical durability and stability, while at the same time offering a tight grip for a user onto the printer thereby reducing the risk of unwanted dropping of the printer. In other embodiments, the handhold might be a strap attached to the housing body.

[0013] According to yet another embodiment of the handheld printer, at least one second printing device may be arranged within a second inner wall of the feed channel. The second printing device may have a printhead configured to print onto the object to be imprinted fed through the feed channel. The second inner wall may be in particular arranged substantially perpendicularly to the first inner wall. 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.

[0014] According to another embodiment of the handheld printer a plurality of first printing devices may be arranged in series within the first inner wall of the feed channel in the housing body. The first printing devices may each have printheads configured to print onto an object to be imprinted fed through the feed channel 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.

[0015] According to another embodiment of the handheld printer, the printer may further comprise at least one registration sensor configured to register a position of the object to be imprinted within the feed channel. The registration sensor may be arranged within one of the inner walls in the feed channel of the housing body as well. 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.

[0016] 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.

[0017] 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.

[0018] According to a further embodiment of the handheld printer, the printer may further comprise a two-part insert having an outer shape corresponding to the shape of the feed channel. The two-part insert may comprise a first part extending into at least a portion of the feed channel from a lid end, adapted to close the inlet, to a connecting end, adapted to detachably latch to a second part. The two-part insert may further comprise a second part extending into at least a portion of the feed channel from a lid end, adapted to close the outlet, to a connecting end, adapted to detachably latch to the first part. One of the first and second parts of the two-part insert may in some embodiments extend substantially from the inlet to the outlet, thus, the respectively remaining part of the first and second parts would substantially be a lid of the

inlet/outlet with latching means to connect to the other part. The two-part insert may be used to close the feed channel to the outside in order to prevent damage to the components in the feed channel during transportation.

[0019] According to a further embodiment of the handheld printer, the printer may further comprise a slidable guide latch arranged within 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.

[0020] According to a further aspect of the invention, a method of obtaining a personalised consumer goods package comprises the steps of inserting a consumer goods package to be imprinted into an inlet of a feed channel formed through a housing body of a handheld printer, inputting user input commands via a user interface of a user input device provided at the housing body of the handheld printer, conveying the consumer goods package from the inlet along the feed channel through the handheld printer towards an outlet of the feed channel, generating printing control signals on the basis of the user input commands input to the user input device, sending the printing control signals to at least one printing device arranged within an inner wall of the feed channel in the housing body, imprinting at least one surface of the consumer goods package with a printhead of the at least one first printing device on the basis of the printing control signals, and retrieving the imprinted consumer goods package from the outlet of the feed channel.

[0021] 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 partially transparent perspective view on the handheld printer of Fig. 1;

Fig. 3 schematically illustrates a partially transparent plan view on inner components of the handheld printer of Fig. 1;

Fig. 4 schematically illustrates a perspective view of a handheld printer according to an embodiment of the invention; and

Fig. 5 schematically illustrates a flow diagram of a method for obtaining a personalized consumer goods package using a handheld printer according to an embodiment of the invention.

[0022] 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.

[0023] Fig. 1 illustrates a perspective view of a handheld printer 10 from a top-front perspective, while Fig. 4 illustrates a perspective view of a handheld printer 10 from a bottom-front perspective. Fig. 2 shows a similar top-front perspective on the handheld printer 10 of Fig. 1 with elements on the front being shown in virtual transparency to illustrate details within the housing body of the printer 10. Finally, Fig. 3 illustrates a plan view on inner components of the handheld printer 10 of Figs. 1 and 2, with the housing body 1 not explicitly being illustrated.

[0024] 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 1 a. The front surface 1 a 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 may include 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. As exemplarily shown in Fig. 4, the handhold 4 may also be configured differently from an integrally formed handle piece and may for example be formed as a separately attachable strap. The strap may be attached to the housing body 1 via rivets, screws or similar attachment means. It should be understood by the skilled person that multiple different possibilities for providing gripping aids to the user of a handheld printer 10 are possible.

[0025] Near the back surface 1 b of the housing body 1, a feed channel 3 is formed through the housing body 1, i.e. a hollow passageway having an inlet opening 3a on a side face 1c of the housing body 1 and an outlet opening 3b on an opposite side face 1d of the housing body 1. The feed channel 3 is formed having inner walls in the hollow passageway separating the inner components within the housing body 1 from the path of the passageway. The feed channel 3 may for example be integrally formed with the housing body 1. The feed channel 3 may for example have the inner shape of a cuboid, i.e. rectangular and congruently shaped inlet and outlet openings 3a, 3b being connected by a tunnel of substantially constant cross-section over the extension of the feed channel 3 through the housing body 1. It may of course also be possible to form the feed channel 3 with rounded corners.

[0026] The feed channel 3 runs from one side face to another side face of the housing body 1. 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 3a on side

face 1c of the printer 10 in an insertion direction and is conveyed through the feed channel 3 until it may be retrieved by a user again at an outlet 3b on the opposite side face 1 d of the printer 10 in a retrieval direction. To convey the package P within the feed channel 3, 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 an inner wall of the feed channel 3, enabling a handover between subsequent conveying devices 9 the further the package P travels within the feed channel 3. 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 one or more of the inner walls of the housing body while the package P is travelling through the feed channel 3.

[0027] In a first of the inner walls of the feed channel 3, 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 1 b. Each of the printing devices 6a may have a printhead configured to print onto an object P to be imprinted fed through the feed channel 3. The printheads may for example extend or protrude at least partially into the feed channel 3 of the housing body 1. Alternatively, the printheads may be set back into the inner portion of the housing body 1 so that a surface of a package P travelling through the feed channel pressed against the first inner wall of the feed channel 3 may be guided near the first printing devices 6a by way of the conveying devices 9 so that the printheads may be spaced apart from a side surface of the package P by a predefined distance. Such distance may for example be in the range between 0.1 mm and 3 mm, and may for example be 1 mm. 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 3 so that eventually each region of the side surface of the package P in contact with or near the printheads may be imprinted along the feed channel 3.

[0028] 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.

[0029] 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 a second inner wall of the feed channel 3, preferably in an inner wall of the housing body 1. 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. The second printing devices 6b may in this case be aligned substantially orthogonally to the at least one first printing devices 6a, i.e. arranged in a second inner wall of the feed channel 3 that is arranged substantially perpendicularly to the first inner wall in which the first printing devices 6a are located.

[0030] A slidable guide latch may be slidably held in a sliding channel in the housing body 1. The slidable guide latch may provide a movable closure of the feed channel 3 in the side face 1 c of the housing body 1. The slidable guide latch may be used to adjust the inlet width of the feed channel 3, and optionally the width of the feed channel 3 overall, for a package P to be imprinted. With the provision of the guide latch, 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 of 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.

[0031] Although not explicitly shown in the drawings, the handheld printer 10 may further comprise a two-part insert that may be used to close of the feed channel 3 to the outside in order to prevent damage to the components in the feed channel 3, for example during transportation. The feed channel 3 may be conveniently closed by means of the two-part insert, for example when the printer 10 is not in use, during transport or during storage of the printer 10. This prevents dust, particles, humidity or other objects from accidentally entering the feed channel 3 and possibly causing damage to the printing devices 6a, 6b, the sensors 8, the conveying devices 9 or other fragile components of the printer 10.

[0032] The two-part insert may generally include a first part and a matching second part that may be latched to the first part at a connection end thereof. The first part and the matching second part may generally have an outer shape that corresponds to the inner shape of the feed channel 3. That way, the first part may be inserted into the feed channel 3 and extend at least partially into the feed channel 3. The lid end of the first part is then adapted to close off the inlet. Similarly, a second part may be inserted into the feed channel 3 from an opposite side face and extend at least partially into the feed chan-

nel 3 as well. The lid end of the second part is then adapted to close off the outlet.

[0033] Both the first part and the second part of the two-part insert may together reach through the complete feed channel 3 so that latching means attached to the respectively inner end portions of the first part and the second part may connect to each other within the feed channel. For example, the first and second part may substantially look the same so that, when being inserted from different ends of the feed channel 3, their connections portions meet substantially in the middle of the feed channel. Alternatively, one of the first and second parts may extend substantially the whole length of the feed channel 3 from the inlet to the outlet, so that the respectively other part of the first and second parts would simply need to be a lid of the inlet/outlet with latching means to connect to the other part.

[0034] The printer 10 may comprise various registration sensors (not explicitly shown) 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 lined up in the housing body 1 along the feeding direction of the package P. The first registrations sensors are configured to track a conveying location of the package P within the feed channel 3. Additionally, the printer 10 may comprise second registrations sensors 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 3. Alternatively or additionally, more registrations sensors may be included in the inner walls of the feed channel 3 within the housing body 1.

[0035] The registrations sensors may for example comprise optical sensors, contact sensors, ultrasonic sensors, light barriers, registration mark readers or similar devices. All registrations sensors 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.

[0036] 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.

[0037] The printer 10 includes a user input device included at a surface of the housing body 1, for example in the front surface 1 a 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 touchscreen 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, for example power switches or volume sliders, or input/output ports 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 7a and user input device.

[0038] 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.

[0039] The user interface 2 may for example display drag & drop content in a display bar 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 on the screen and then edited by use of digital paint tools displayed in a paint dialogue bar, 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 may be displayed when the user is done with customizing the printing model and wants to initiate the printing process.

[0040] Then, the user interface 2 may display instructions for the user to insert a package P in the inlet of the feed channel 3. 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 outlet 3b of the feed channel 3 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 3. 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.

[0041] Fig. 5 illustrates an exemplary flow diagram of a method M for obtaining a personalised consumer goods package P. The method M may in particular be performed using a handheld printer 10 as described and explained in conjunction with Figs. 1 to 4. In a first step M1, a consumer goods package P to be imprinted may be inserted into an inlet of a feed channel 3 formed through a housing body 1 of a handheld printer 10. Then, a user may input commands via a user interface 2 of a user input device provided at the housing body 1 of the handheld printer 10 in a second step M2. In a third step M3, the consumer

goods package P is conveyed from the inlet along the feed channel 3 through the handheld printer 10 towards an outlet of the feed channel 3. On the basis of the user input commands input to the user input device, printing control signals are generated in a step M4 and sent to at least one printing device 6a arranged within an inner wall of the feed channel 3 in the housing body 1 in a step M5. At least one surface of the consumer goods package P is imprinted with a printhead of the at least one first printing device 6a on the basis of the printing control signals in a step M6 so that the imprinted consumer goods package P may be retrieved from the outlet of the feed channel 3 in a step M7.

[0042] 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);
a feed channel (3) formed through the housing body (1), the feed channel (3) having an inlet for inserting an object (P) to be imprinted into the feed channel (3) and an outlet for retrieving the imprinted object (P) from the feed channel (3);
at least one first printing device (6a) arranged within a first inner wall of the feed channel (3) in the housing body (1) and having a printhead configured to print onto an object (P) to be imprinted fed through the feed channel (3);
a user input device provided at the housing body (1) and 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, wherein the printhead of the at least one first printing device (6a) is spaced apart from the object (P) to be imprinted by a predefined distance, preferably in the range between 0.1 mm and 3 mm.

3. The handheld printer (10) according to claim 1 or 2, further comprising at least one conveying device (9) arranged in the feed channel (3) and configured to convey an object (P) to be imprinted by the handheld printer (10) from the inlet to the outlet through the feed channel (3).

4. The handheld printer (10) according to claim 3, 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 first inner wall of the feed channel (3) in which the at least one first printing device (6a) is arranged while the object (P) is fed through the feed channel (3).

6. The handheld printer (10) according to one of the claims 1 to 5, wherein the housing body (1) includes a handhold (4) for a user to carry the printer (10) in his/her hands, preferably the housing body (1) being integrally formed with the handhold (4).

7. The handheld printer (10) according to one of the claims 1 to 6, comprising a plurality of first printing devices (6a), the plurality of first printing devices (6a) being arranged in series within the first inner wall of the feed channel (3) in the housing body (1) and having printheads configured to print onto an object (P) to be imprinted fed through the feed channel (3) with staggered offsets along the extension of the feed channel (3).

8. The handheld printer (10) according to one of the claims 1 to 7, further comprising at least one registration sensor configured to register a position of the object (P) to be imprinted within the feed channel (3).

9. The handheld printer (10) according to claim 8, wherein the printer controller (7a) is coupled to the at least one registration sensor 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.

10. The handheld printer (10) according to one of the claims 1 to 9, 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.

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

12. The handheld printer (10) according to one of the claims 1 to 11, further comprising a slidable guide latch arranged within the housing body (1) and configured to slidably adjust the inlet width of the feed channel (3) for an object (P) to be imprinted.

13. The handheld printer (10) according to one of the claims 1 to 12, further comprising at least one second printing device (6b) arranged within a second inner wall of the feed channel (3) in the housing body (1) and having a printhead configured to print onto an object (P) to be imprinted fed through the feed channel (3), the second inner wall being preferably arranged substantially perpendicularly to the first inner wall.

14. The handheld printer (10) according to claim 13, wherein the at least one second printing device (6b) is arranged substantially orthogonally to the at least one first printing device (6a).

15. A method (M) of obtaining a personalised consumer goods package, comprising the steps of:

inserting (M1) a consumer goods package (P) to be imprinted into an inlet of a feed channel (3) formed through a housing body (1) of a handheld printer (10);
inputting (M2) user input commands via a user interface (2) of a user input device provided at the housing body (1) of the handheld printer (10);
conveying (M3) the consumer goods package (P) from the inlet along the feed channel (3) through the handheld printer (10) towards an outlet of the feed channel (3);
generating (M4) printing control signals on the basis of the user input commands input to the user input device;
sending (M5) the printing control signals to at least one printing device (6a) arranged within an inner wall of the feed channel (3) in the housing body (1);
imprinting (M6) at least one surface of the consumer goods package (P) with a printhead of the at least one first printing device (6a) on the basis of the printing control signals; and
retrieving (M7) the imprinted consumer goods package (P) from the outlet of the feed channel (3).

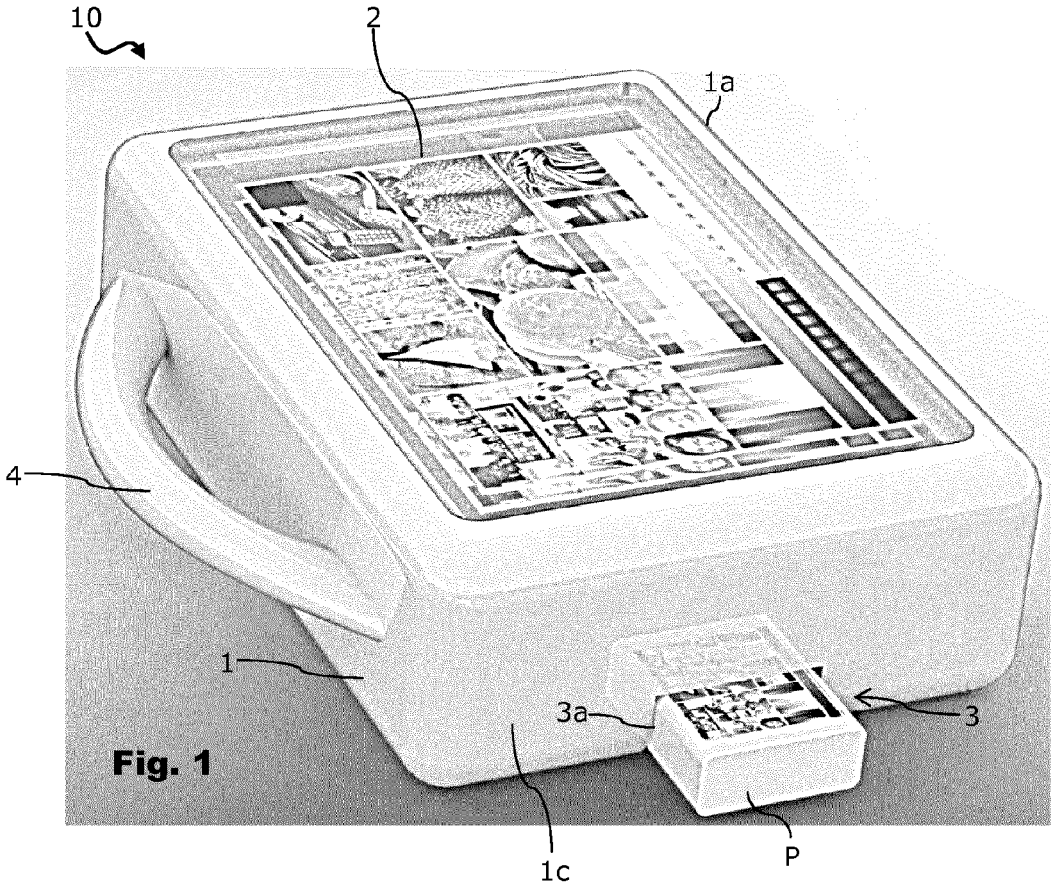


Fig. 1

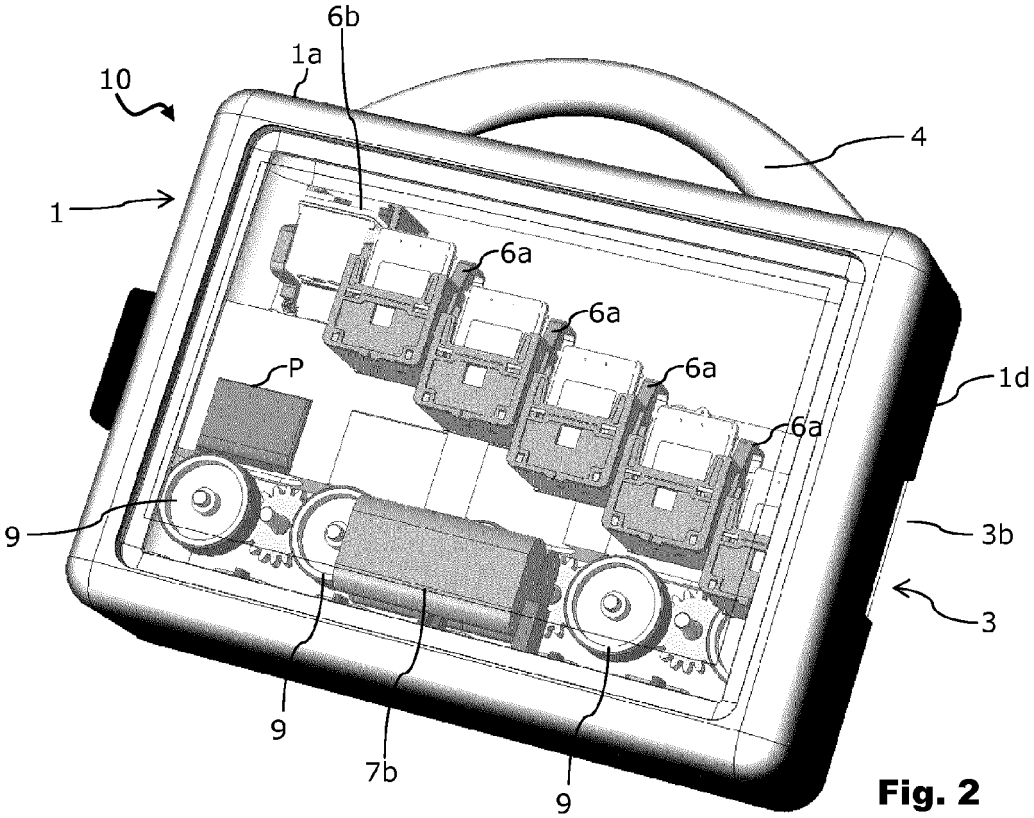


Fig. 2

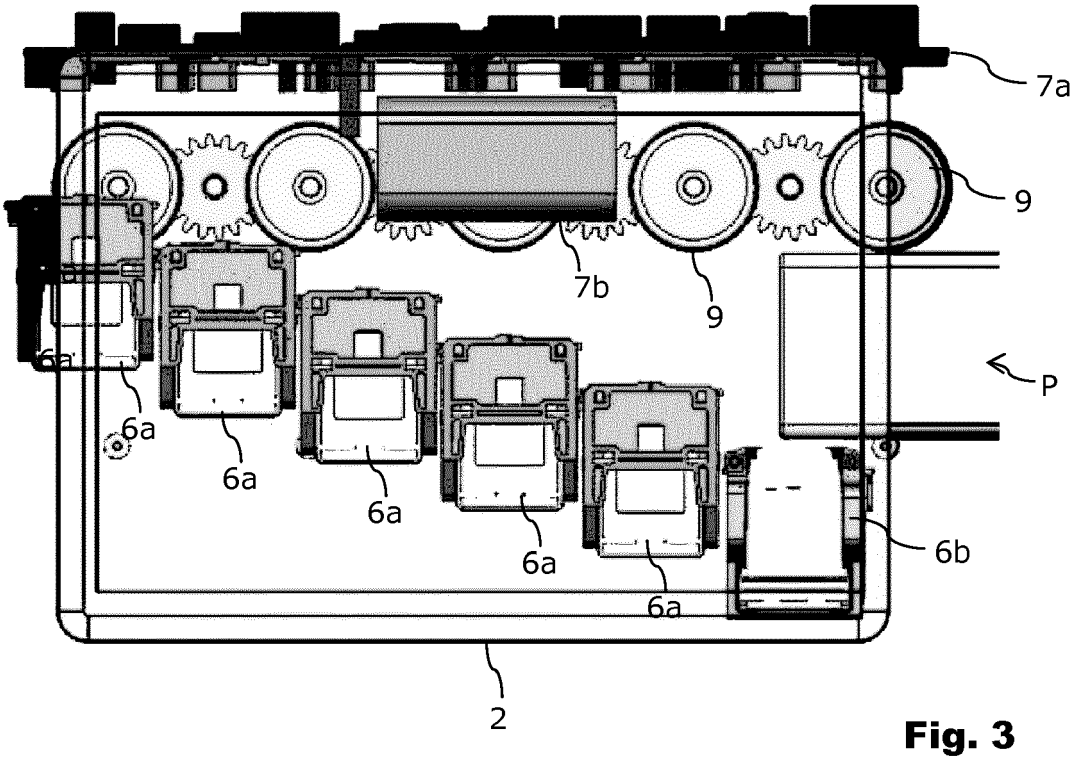


Fig. 3

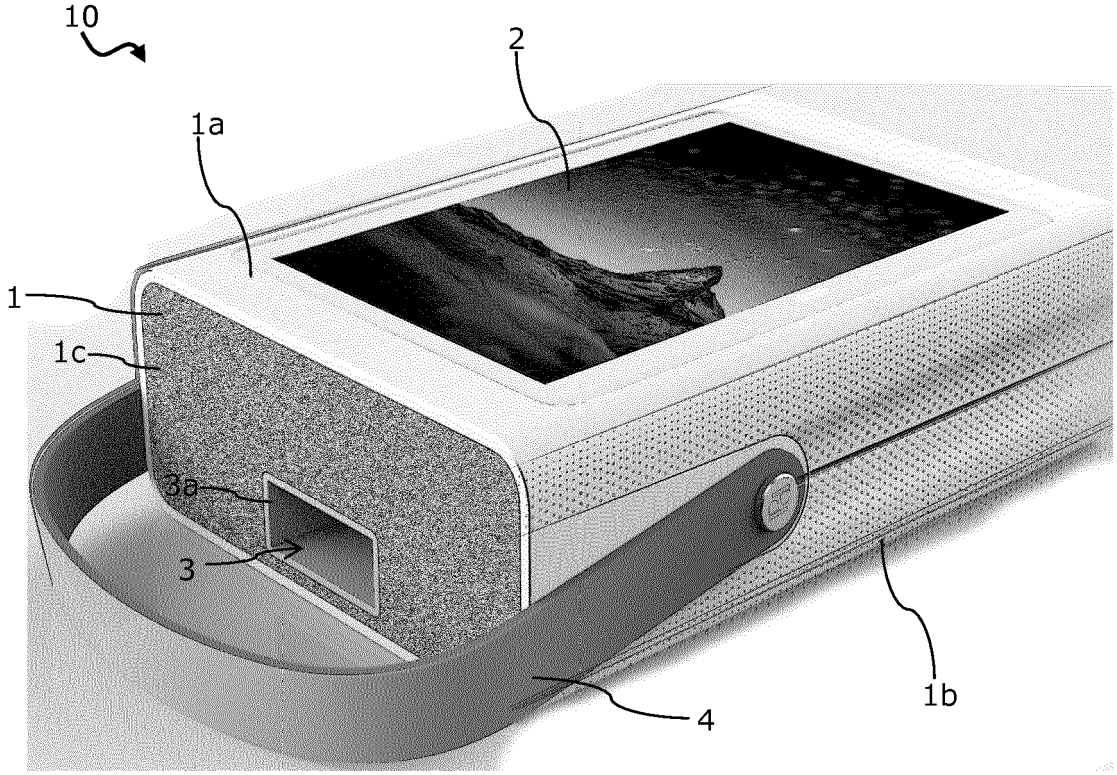


Fig. 4

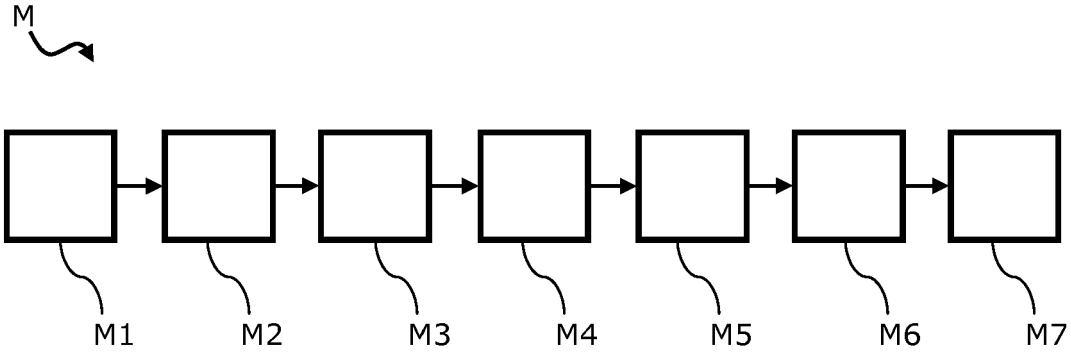


Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 0161

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
E	EP 3 121 014 A1 (JT INT S A [CH]) 25 January 2017 (2017-01-25) * the whole document * -----	1-15	INV. B41J3/36 B41J3/28 B41J3/54 B41J3/407

TECHNICAL FIELDS SEARCHED (IPC)

B41J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 January 2017	Gaubinger, Bernhard

CATEGORY OF CITED DOCUMENTS

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EP 3121014 A1	25-01-2017	NONE	

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