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(54) METHOD OF MANUFACTURING A SHAVER

(57) A method of manufacturing a shaver element including at least a shaver handle element (2) for a wet shaver, comprising a digital fabrication step (123) wherein said shaver element is made by digital fabrication technology.

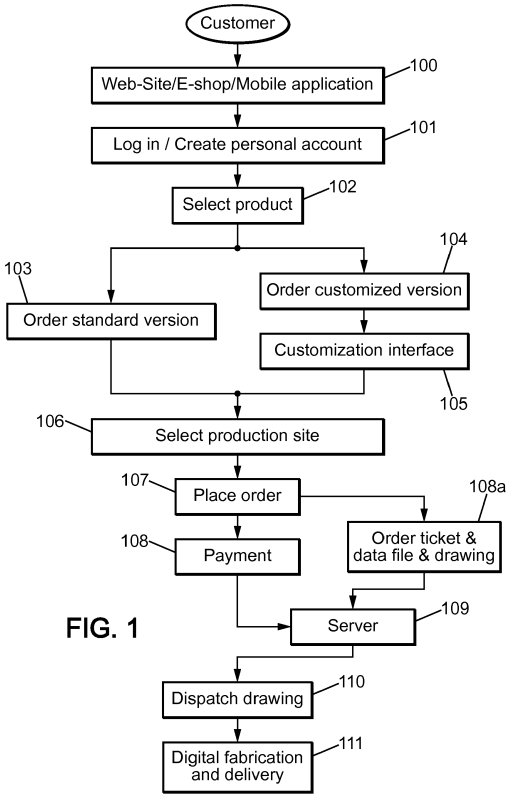


FIG. 1

EP 3 372 360 A1

Description

FIELD OF DISCLOSURE

[0001] The disclosure relates to methods of manufacturing shaver elements and to shaver elements manufactured according to such methods, said shaver elements including at least a shaver handle.

BACKGROUND

[0002] Shaver handle elements (i.e., a shaver handle or part of a shaver handle) are usually plastic molded parts, injection molded as a single part or sometimes molded as several parts which are later assembled.

[0003] WO2006081842 shows an example of a known shaver handle element.

[0004] One purpose of the present concept is to improve the manufacturing of shaver handle elements of the prior art, at least with regard to material consumption and / or economy and / or easiness of manufacturing and / or improved aesthetics.

SUMMARY OF THE DISCLOSURE

[0005] To this end, the present description proposes a method of manufacturing a shaver element including at least a shaver handle element for a wet shaver, said method comprising a digital fabrication step wherein said shaver element is made by digital fabrication based on a 3D digital file.

[0006] Digital fabrication, as referred to here, may designate any additive manufacturing technology. Additive technology is often also called three dimensional (3D) printing. A 3D printer, as referred to here, may designate any machine for digital fabrication.

[0007] Although shaver handle elements may be subject to relatively high mechanical stress, shaver handle elements obtained by the method of the invention turned out to fulfill all mechanical requirements of shaver handle elements.

[0008] The method according to the disclosure enables to manufacture the shaver handle element easily and without costly investment. In particular, no mold has to be designed, manufactured and stored, contrary to current methods of manufacturing shaver handle elements.

[0009] The overall manufacturing cost may be lower than with injection molding, at least for relatively small production volumes.

[0010] The proposed method further provides more manufacturing flexibility, since the shape of the handle element can be modified easily without having to invest in new molds and / or change molds installed on injection molding machines as in the current situation.

[0011] Further, each 3D printer can be switched very easily from one type of handle element to another, simply by sending to the 3D printer a new data file corresponding to the handle element to manufacture. The manufacturing facility thus becomes very versatile and can be continuously adapted to demand.

[0012] Further, since the manufacturing facility requires lower investment and relatively easy maintenance, it may be decentralized and located closer to the customer, thus enabling better and quicker delivery to the customer, less delivery costs and a more environmentally friendly process.

[0013] Additionally, digital fabrication may enable to manufacture shaver handle elements in one piece even in case the shape thereof is unmoldable because of complex geometry, or in case the material thereof is unmoldable. More generally, digital fabrication makes the design of the handle element more flexible and simpler, since it is not subject to the limitations of injection molding in terms of tooling (injection molding requires machines and molds with cavities and inserts for each part), in terms of geometry (injection molding requires specific geometry to enable the parts to be unmolded), or otherwise. The geometry of the handle may thus be optimized so that the handle uses less material than a handle manufactured by injection molding, while fulfilling the same mechanical requirements and functionalities.

[0014] The method described hereafter may also enable to design and manufacture handle elements as a single piece even in some cases where the handle element includes moving parts, which would not be possible with injection molding. The manufacturing process is thus made simpler and less costly, since it does not require separate manufacture, handling and assembly of parts.

[0015] Embodiments of such method may incorporate one or more of the following features:

- said shaver handle element is a shaver handle handle with at least on attachment element for attaching a shaver head;
- at said printing step, said shaver handle element is made in one piece with at least part of a shaver head adapted to receive shaving blades;
- said printing step is carried out by using a digital fabrication technology chosen among additive manufacturing technologies such as material extrusion (e.g. fused deposition modeling, etc.), material jetting, VAT photopolymerization (e.g. digital light processing and electron beam melting, stereolithography, etc.), sheet lamination, direct energy deposition, powder bed fusion (e.g. laser sintering, etc.) and binder jetting;
- at said digital fabrication step, the handle element is made at least partly of metal;
- at said digital fabrication step, the shaver element is made of at least two materials (but it can be also made of only one material);
- said at least two materials include an elastomeric material, and at said digital fabrication step, the shaver element is made in one piece with at least two rigid portions joined by an elastic portion made of

said elastomeric material, said elastic portion enabling relative movement between said rigid portions;

- the method further comprises an order process which includes a connection step wherein a customer connects to a server to order said shaver element, said digital fabrication step being launched as a result of the order process;
- in said order process, the customer communicates with the server via a web interface or a mobile application;
- the order process further including the following steps:

    - a production site selection step wherein a production site is chosen,
    - a drawing dispatching step wherein 3D digital models are sent to the chosen production site, said digital fabrication step is carried out at the chosen production step based on the 3D digital models;

- at said production site selection step, the customer may choose between digital fabrication in a shaver factory and at least one of digital fabrication on a public 3D printer and digital fabrication on a private 3D printer;
- the order process further includes a customization step wherein the customer may customize the shaver element via a 3D interface enabling the customer to view the customized shaver element in 3D;
- at said customization step, the user is able to customize at least one of a material of the shaver element, a color of the shaver element dimensions and / or shape (114a) of the shaver element, and special graphics of the shaver element;
- the order process further includes a possibility for the customer to upload 3D digital models on the server and wherein said digital fabrication step is carried out based on said 3D digital models.

[0016] Besides, the disclosure also concerns a shaver element made in one piece with at least two rigid portions joined by an elastic portion made of elastomeric material, said elastic portion enabling relative movement between said rigid portions.

[0017] In embodiments, the shaver element includes a releasable head to handle attachment having a body, at least one attachment element (for instance two arms) movably supported by the body between an active locking position where said at least one attachment element is adapted to bear a shaver head and a release position where said at least one attachment element is adapted to release said shaver head, an actuation member adapted to mechanically actuate (directly or indirectly) the at least one attachment element, said actuation member being adapted to be manually actuated by a user for moving the at least one attachment element in the release position, said elastic portion being interposed between the actuation member and the body to bias the actuation member in a rest position corresponding to the active position of the at least one attachment element.

[0018] The above and other objects and advantages of the disclosed method will become apparent from the detailed description of one embodiment thereof, considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] In the drawings:

- Figure 1 is a block diagram illustrating a method of manufacturing a shaver element according to embodiments of the disclosure;
- Figure 2 is a detail of step 105 of figure 1;
- Figure 3 is a detail of step 106 of Figure 1;
- Figure 4 is a detail of step 107 of Figure 1;
- Figure 5 is a detail of step 111 of Figure 1;
- Figures 6 and 7 are block diagrams similar to Figure 1, showing two variants of the method described;
- Figure 8 is an overall perspective view of a shaver having a shaver element which may be manufactured according to the disclosed method;
- Figure 9 is an overall perspective view of a shaver having a shaver element which may be manufactured according to the disclosed method, with the shaver head mounted on the shaver handle;
- Figure 10 is a view similar to Figure 9, with the shaver head released from the shaver handle; and
- Figure 11 is a section view of the shaver of Figures 9 and 10, the shaver being cut in the plane XI-XI of Figure 9.

MORE DETAILED DESCRIPTION

[0020] In the drawings, the same reference numerals denote identical or similar elements.

[0021] The below description, concerns in particular a method of manufacturing a shaver element.

[0022] The shaver element can be part or the entirety of a shaver 1, as illustrated for instance on Figure 8 or on Figures 9-11. The shaver 1 comprises at least a shaver handle 2 and a shaver head 3. The shaver head 3 may have a guard bar 4, one or several blades 5 and possibly a cover 6 or similar. The shaver head 3 may be a stand alone part or comprise an interconnecting member. The handle 2 may comprise an elongated handle body 7 and a head supporting portion 8 bearing the shaver head 3.

[0023] The handle body 7 is adapted to be held in hand by a user. The handle body 7 extends between a distal end 9 (opposite the head portion 8) and a proximal end 10 (close to the head supporting portion 8), along a central line C. The central line C may be curved. The central line C may be included in a sagittal plane.

[0024] The shaver head 3 may be connected to the head supporting portion 8 by any known way, for instance enabled to pivot around a pivot axis perpendicular to the

sagittal plane, or otherwise.

[0025] The shaver element as manufactured by the method, may preferably include a shaver handle element. The shaver handle element may include at least part of the shaver handle 2.

[0026] In some embodiments, the shaver handle element includes the complete shaver handle 2, including at least one attachment element for attaching the shaver head 3.

[0027] In some embodiments, the shaver handle element may include only part of the shaver handle 2.

[0028] In some embodiments, the shaver element may also include at least part of the shaver head 3.

[0029] The shaver element may be formed in one piece.

[0030] The shaver element may be formed by digital fabrication as defined above, also called additive manufacturing.

[0031] The shaver element may be formed in one or several materials, including any material compatible with at least one method of digital fabrication. For instance, the shaver element 2 may be formed in one or several of the following materials: plastic materials, metals, mixtures of synthetic and natural materials including wood, glass and paper, etc.

[0032] In some embodiments, the shaver element may be made of at least two materials. Said at least two materials may include an elastomeric material. In specific embodiments, the shaver element may be made in one piece with at least two rigid portions joined by an elastic portion made of said elastomeric material, said elastic portion enabling relative movement between said rigid portions. An example of such specific embodiment will be described below with regard to Figures 9-11.

[0033] In another embodiment the handle may be produced around any object (e.g. an insert made of any known material) entrapping it and enabling it to move freely in the end product.

[0034] One example of a method of manufacturing and delivering a shaver element is illustrated at Figure 1.

[0035] In the example of Figure 1, a customer follows an order process to order a certain quantity of shaver element(s), and then the shaver element(s) is printed by digital fabrication and delivered.

[0036] In the order process, the customer may first go through a connection step, which may include for instance the following substeps:

- A substep 100 of launching an interface such as a web interface (web site / E-shop) or a mobile application;
- A substep 101 wherein the customer logs in if he or she already has a personal account, or creating a personal account.

[0037] At step 102, the customer may then select the product to be manufactured through the interface, i.e. at least the shaver element to be manufactured.

[0038] Once the product is chosen, the customer may choose, via the interface, either to order a standard version of the product at step 103, or to order a customized version of the product at step 104. In that case, the customer may go through a customization step 105 using a customization interface.

[0039] One example of such customization step 105 is shown at Figure 2.

[0040] At said customization step 105, the user may customize at least one of a material of the shaver element (at substep 112), a color of the shaver element (at substep 113), dimensions and / or shape of the shaver element (at substep 114a - e.g. internal or external dimensions, Voronoi diagram, gripping features etc and special graphics of the shaver element (at substep 114).

[0041] At said customization step 105, the customer may customize the shaver element via a 3D interface enabling the customer to view the customized shaver element in 3D digital view (at substep 115). The customer validates the customized shaver element at the end of the customization step 105, once he or she is satisfied with the customized shaver element.

[0042] Coming back to Figure 1, the order process may include a production site selection step 106 wherein a production site is chosen. An example of such production site selection step 106 is illustrated at Figure 3.

[0043] At said production site selection step 106, the customer may be able to choose, via the interface, between fabricating on a public 3D printer (step 116) and fabricating in a shaver factory (step 126). If the user chooses to digital fabricate on a public 3D printer, he or she may choose the private 3D printer from a list, at step 117. If the user chooses to fabricate in a shaver factory, he or she may add personnel information via the interface, at step 127.

[0044] Coming back to Figure 1, once the order is complete, the user may place the order at step 107 via the interface. The user may then pay the order at a payment step 108 and payment is confirmed to the server 109. Also, an order ticket, a data file and 3D drawings corresponding to the ordered shaver element(s) may be sent to the server 109 at step 108a.

[0045] An example of the payment step 107 is illustrated at Figure 4. The payment may be done through a payment interface 118, offering for instance to pay either by credit / debit card at substep 119, or via online money transfer (e.g. PayPal® or similar) at substep 120, or otherwise. A payment confirmation may be received at substep 121.

[0046] Coming back to Figure 1, once the order has been validated on server 109, server 109 dispatches the 3D digital models to the adequate 3D printer at step 110 and the shaver element(s) is / are digital fabricated on the 3D printer and delivered at a digital fabrication and delivery step 111.

[0047] An example of the digital fabrication and delivery step 111 is illustrated at Figure 5:

- The 3D digital models are received by the chosen 3D printer 122;
- The shaver element is digital fabricated at digital fabrication step 123;
- An Estmated Delivery Time is sent to the customer at substep 124;
- The order is delivered to the customer at substep 125.

[0048] A variant of the manufacturing method of Figure 1 is illustrated at Figure 6. In the variant of Figure 6, at the production site selection step 106, the interface may allow the customer to choose digital fabrication on a private 3D printer, e.g. his or her own 3D printer. This possibility may be considered/added to the possibilities already described regarding the production site selection step 106. The rest of the method may be similar to the method of figure 1 and will not be described again here.

[0049] Another variant is illustrated at Figure 7. The variant of Figure 7 differs from the method of Figure 1 in the fact that steps 102-105 are replaced by a step 128 where the customer may upload 3D digital models on the server 109 via the interface, and then the uploaded 3D digital models may be digital fabricated on the 3D printer. This step 128 may be proposed simultaneously with said steps 102-105, as an alternative, by the interface. The rest of the method may be similar to the method of figure 1 and will not be described again here.

[0050] Figure 8 and Figures 9-11 show respectively two examples of shaver elements which may be manufactured by a method as described above.

[0051] In the case of Figure 8, the handle body 7 may have a cell structure 7a, 7b formed by juxtaposed hollow cells 7b, at least partly separated by solid walls 7a.

[0052] The solid walls 7a may advantageously form a continuous, single solid part.

[0053] The solid walls 7a may form a network of solid threads or arms which are connected together.

[0054] Advantageously, the cell structure 7a, 7b may be formed based on a Voronoi diagram.

[0055] In a particularly advantageous embodiment, as shown in Figure 8, said cell structure 7a, 7b is a grid shell structure. Such grid shell structure forms a continuous skin or shell which extends on the outside surface of the handle body, thus defining the external shape of the handle body 7 and surrounding an inner volume of the handle body. In that case, the above mentioned hollow cells 7b are formed in the grid shell structure and are open toward the inner volume and at the outside surface. In that case, said solid walls 7a define the thickness of the grid shell structure.

[0056] In the example of Figure 8, the inner volume is empty and free of solid walls. In other embodiments, not shown, the inner volume may include solid walls belonging to the cell structure and defining empty cells, for instance according to a 3D Voronoi diagram.

[0057] In another embodiment, one or more various inserts may be included in the empty inner volume. Each insert may be able to move freely in the empty volume or it may be fixed on a specific place in order to enhance ergonomy.

[0058] The shaver handle 2 of Figure 8 may be manufactured in one piece by the method of the invention, which would not be possible by injection molding.

[0059] In the case of Figures 9-11, the shaver handle 2 or at least the head supporting portion 8 thereof may be manufactured according to the invention as one single piece, with at least two materials including for instance a plastic material and an elastomeric material.

[0060] The shaver 1 of Figures 9-11 may be similar to the one disclosed in WO2010037418A1.

[0061] The head supporting portion 8 may form a releasable head to handle attachment. More particularly, the shaver head 3 may be releasable from the head supporting portion 8 by actuation of an actuation member 13 such as an actuation button 13.

[0062] The shaver head 3 may be pivotally mounted on at least one attachment element belonging to the head supporting portion 8, for instance two lateral arms 15. The shaver head 3 may be elastically biased to a rest position by a free end 19A of an elastic tongue 19 also belonging to the head supporting portion 8.

[0063] The lateral arms 15 may for instance have shell bearings 16 cooperating with complementary shell bearings 17 for pivotally supporting the shaver head 3.

[0064] The head supporting portion 8 may include a body 22 formed in plastic material with the tongue 19 and the lateral arms 15, said lateral arms 15 being elastically movable between an active position (Figure 9) where said lateral arms 15 bear the shaver head 3 and a release position (Figure 10) where said lateral arms 15 release said shaver head 3.

[0065] The head supporting portion 8 further includes the actuation member 13, which may be mechanically coupled with the lateral arms 15 for instance as disclosed in WO2010037418A1. The actuation member 13 is adapted to be manually actuated by a user for moving the lateral arms 15 in the release position. The actuation member 13 may include a pusher 18 to eject the shaver head 3 when the actuation member 13 is actuated. The actuation member 13 may also be formed in plastic material.

[0066] The head supporting portion 8 may further include an elastic portion 23 of elastomeric material, interposed between the actuation member 13 and the body 22. More particularly, the elastic portion 23 may be interposed between a rear portion 21 of the actuation member 13 and the body 22. The elastic portion 23 allows movement of the actuation member 13 forward in the longitudinal direction of the shaver handle when the actuation member 13 is actuated. The elastic portion 23 also biases the actuation member 13 in a rest position corresponding to the active position of the arms. The elastic portion and the whole mechanism may be produced by a digital fabrication method, according to the method described above, in one step. In this case there is no need for as-

sembly of the mechanism.

[0067] Of course, the invention is not limited to the particular head to handle attachment features, it may be applicable to any head to handle attachments, including more complex head to handle attachments.

Claims

1. A method of producing a shaver element including at least a shaver handle element (2) for a wet shaver, said method comprising a digital fabrication step (123) wherein said shaver element is made by digital fabrication based on a 3D digital file.

2. A method as claimed in claim 1, wherein said shaver handle element (2) is a shaver handle with at least on attachment element (15) for attaching a shaver head (3).

3. A method as claimed in claim 1 or claim 2, wherein at said fabrication step (124), said shaver handle element (2) is made in one piece with at least part of a shaver head (3) adapted to receive shaving blades.

4. A method as claimed in any of the preceding claims, wherein said digital fabrication step (123) is carried out by using a digital fabrication technology chosen among material extrusion, material jetting, VAT photopolymerization, sheet lamination, direct energy deposition, powder bed fusion and binder jetting.

5. A method as claimed in any of the preceding claims, wherein at said fabrication step (124), the shaver element is made of at least two materials.

6. A method as claimed in claim 5, wherein said at least two materials include an elastomeric material, and at said fabrication step (124), the shaver element is made in one piece with at least two rigid portions (21, 22) joined by an elastic portion (23) made of said elastomeric material, said elastic portion (23) enabling relative movement between said rigid portions (21, 22).

7. A method as claimed in any of the preceding claims, further comprising an order process which includes a connection step (100, 101) wherein a customer connects to a server (109) to order said shaver element, said digital fabrication step (123) being launched as a result of the order process.

8. A method as claimed in claim 7, wherein the order process further includes the following steps:

   - a production site selection step (106) wherein a production site is chosen,
   - a drawing dispatching step (110) wherein 3D digital models are sent to the chosen production site,

   and wherein said fabrication step (123) is carried out at the chosen manufacturing step based on the 3D digital models.

9. A method as claimed in claim 8, wherein at said production site selection step (106), the customer may choose between digital fabrication in a shaver factory (126) and at least one of digital fabrication on a public 3D printer (116) and digital fabrication on a private 3D printer.

10. A method as claimed in any of claim 7-9, wherein the order process further includes a customization step (105) wherein the customer may customize the shaver element via a 3D interface (115) enabling the customer to view the customized shaver element in 3D.

11. A method as claimed in claim 10, wherein at said customization step (105), the user is able to customize at least one of:

    a material (112) of the shaver element,
    a color (113) of the shaver element,
    dimensions and / or shape (114a) of the shaver element,
    and special graphics (114) of the shaver element.

12. A method as claimed in any of claim 8-11, wherein the order process further includes a possibility for the customer to upload (128) 3D digital models on the server and wherein said digital fabrication step (123) is carried out based on said 3D digital models.

13. A shaver element made in one piece with at least two rigid portions (21, 22) joined by an elastic portion (23) made of elastomeric material, said elastic portion (23) enabling relative movement between said rigid portions (21, 22).

14. A shaver element according to claim 13, including a releasable head to handle attachment having a body (22), at least one attachment element (15) movably supported by the body (22) between an active position where said at least one attachment element (15) is adapted to bear a shaver head (3) and a release position where said at least one attachment element (15) is adapted to release said shaver head (3), an actuation member (13) adapted to mechanically actuate the at least one attachment element (15), said actuation member (13) being adapted to be manually actuated by a user for moving the at least one attachment element (15) in the release position, said elastic portion (23) being interposed between the ac-

tuation member (13) and the body (22) to bias the actuation member (13) in a rest position corresponding to the active position of the at least one attachment element (15).

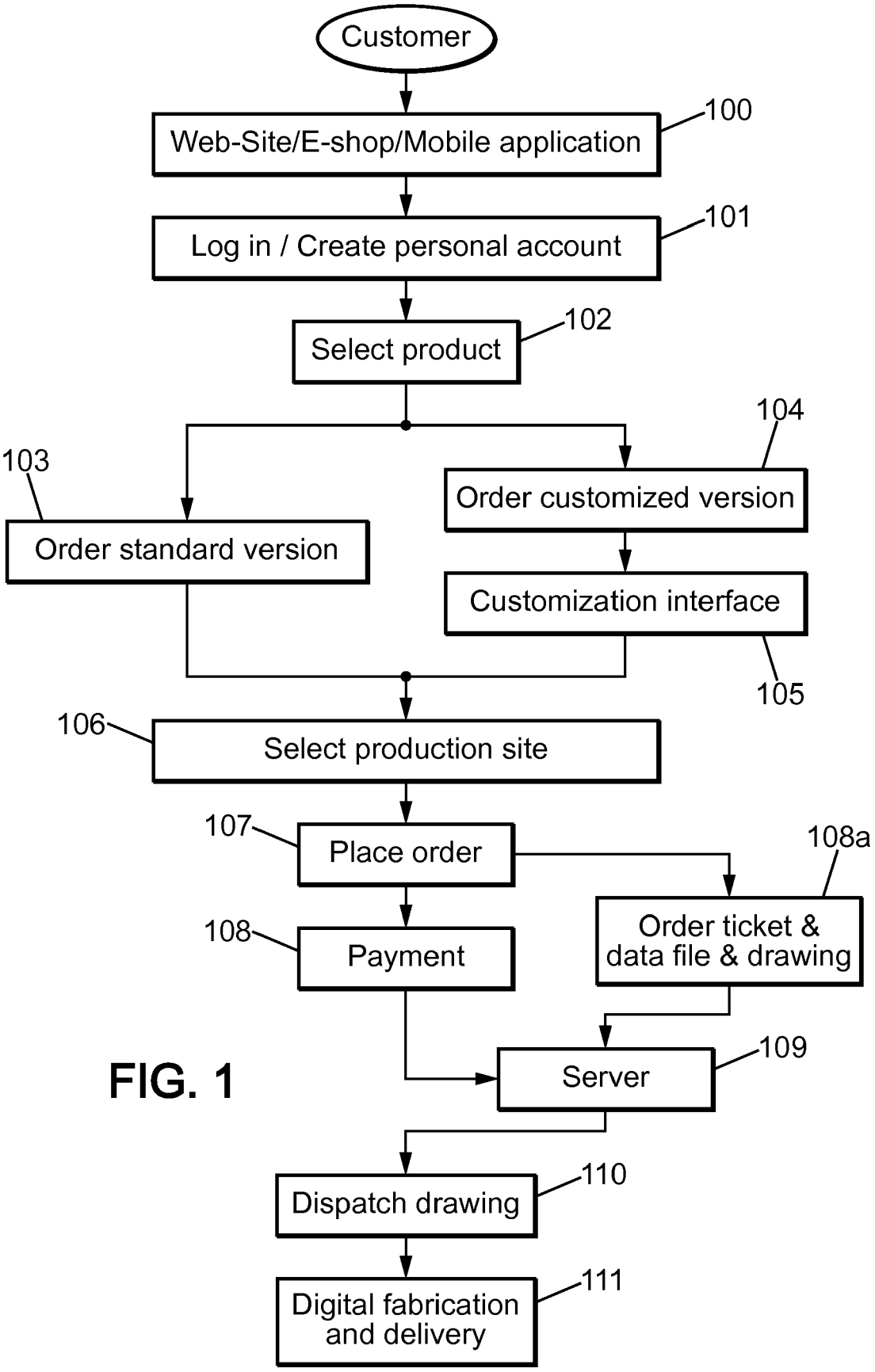

Customer
Web-Site/E-shop/Mobile application
100
Log in / Create personal account
101
Select product
102
104
103
Order customized version
Order standard version
Customization interface
105
106
Select production site
107
Place order
108a
108
Payment
Order ticket & data file & drawing
Server
109
Dispatch drawing
110
Digital fabrication and delivery
111

FIG. 1

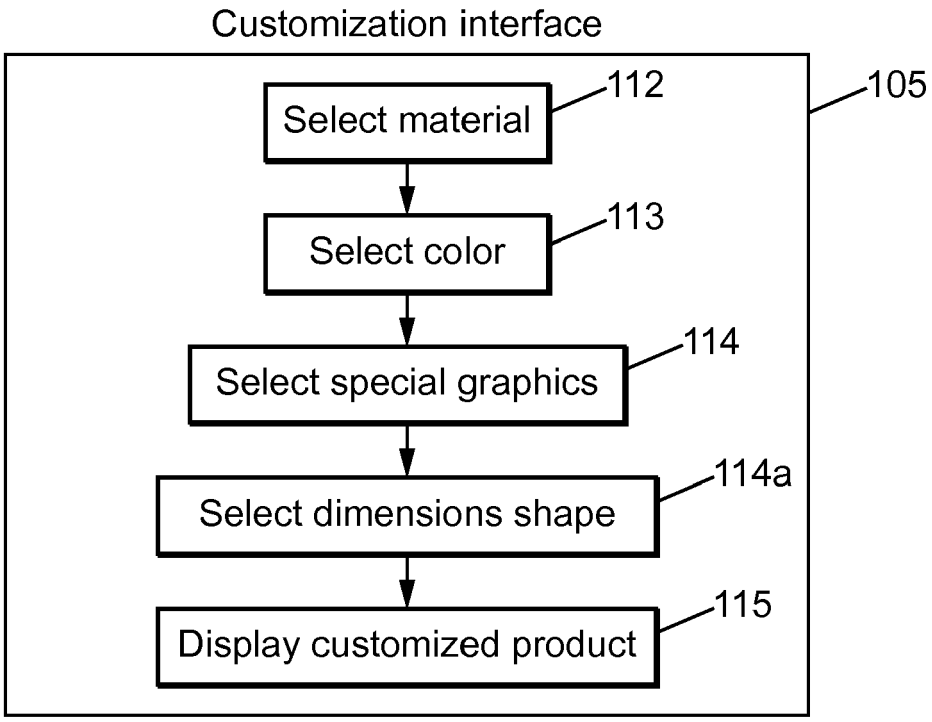

Customization interface
Select material
112
105
Select color
113
Select special graphics
114
Select dimensions shape
114a
Display customized product
115

FIG. 2

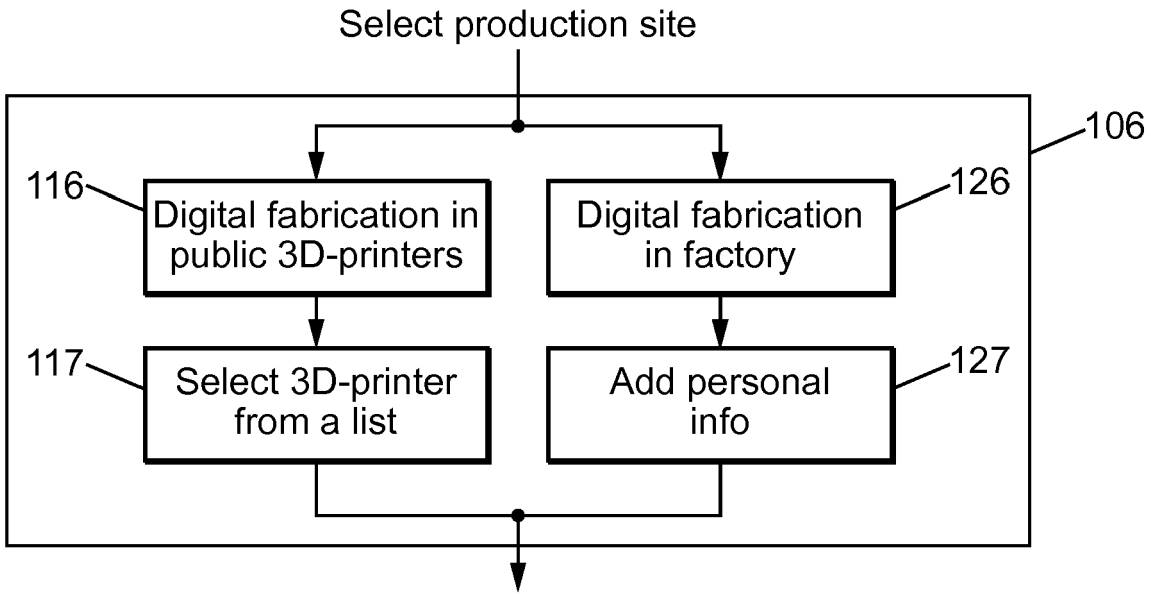

Select production site
106
116
Digital fabrication in public 3D-printers
126
Digital fabrication in factory
117
Select 3D-printer from a list
127
Add personal info

FIG. 3

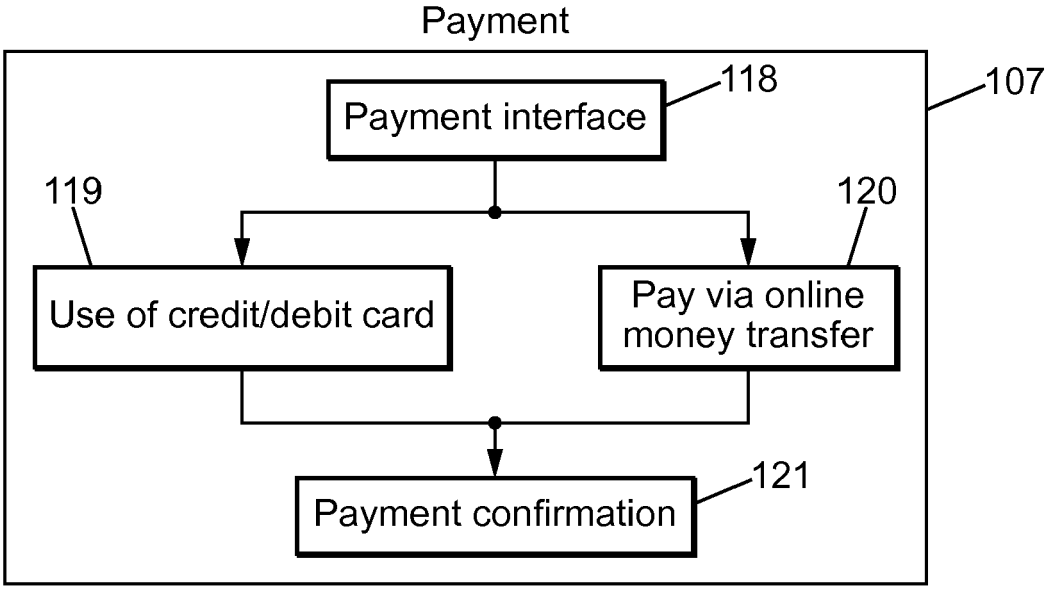

Payment
Payment interface
118
107
119
120
Use of credit/debit card
Pay via online money transfer
Payment confirmation
121

FIG. 4

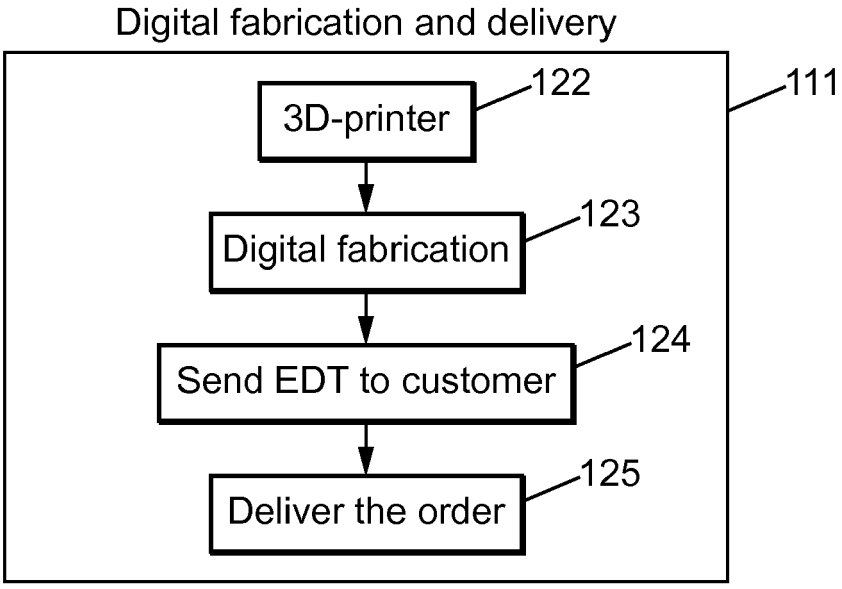

Digital fabrication and delivery
3D-printer
122
111
Digital fabrication
123
Send EDT to customer
124
Deliver the order
125

FIG. 5

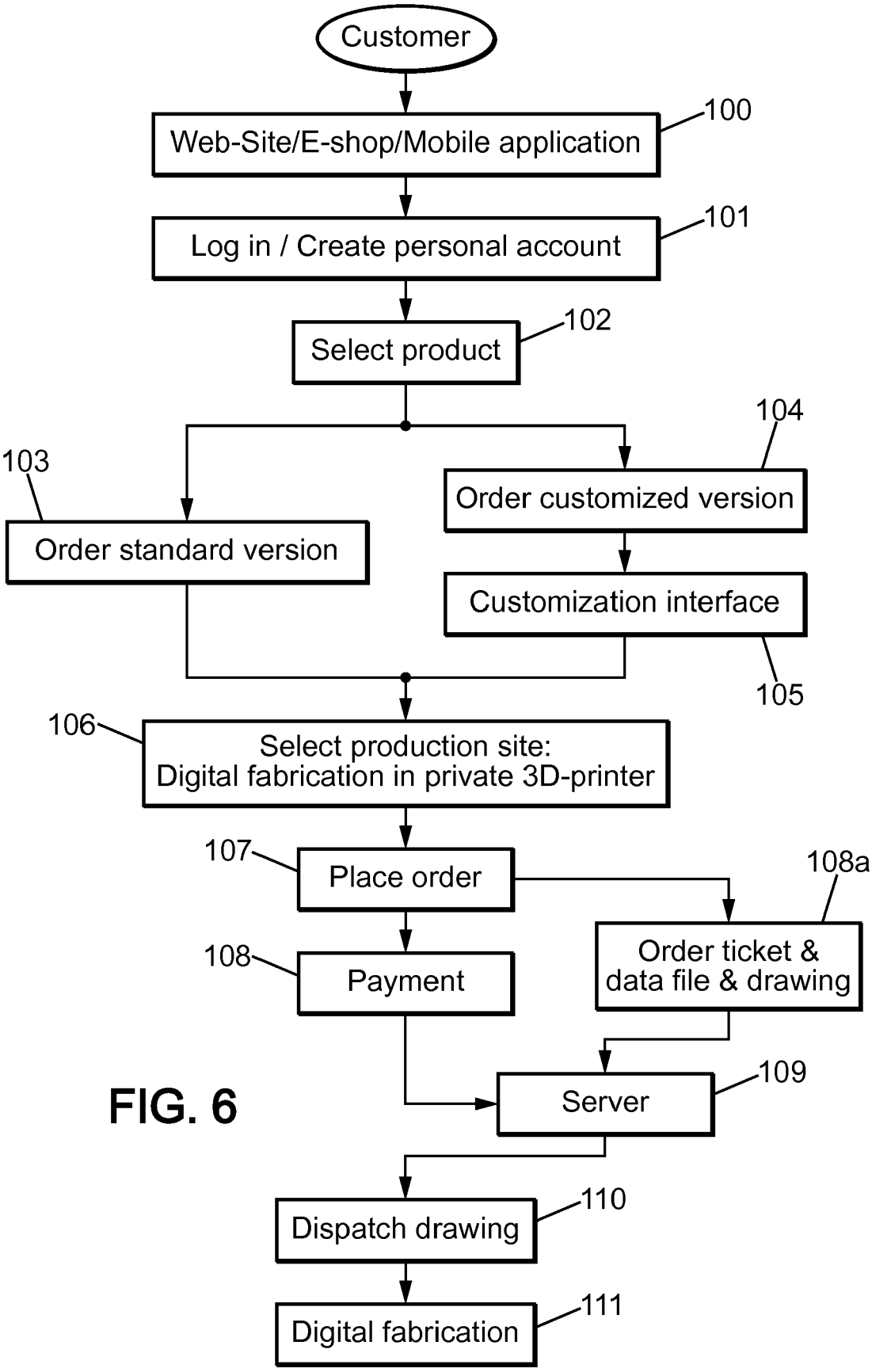

Customer
Web-Site/E-shop/Mobile application
100
Log in / Create personal account
101
Select product
102
104
103
Order customized version
Order standard version
Customization interface
105
106
Select production site:
Digital fabrication in private 3D-printer
107
Place order
108a
108
Payment
Order ticket &
data file & drawing
Server
109
Dispatch drawing
110
Digital fabrication
111

FIG. 6

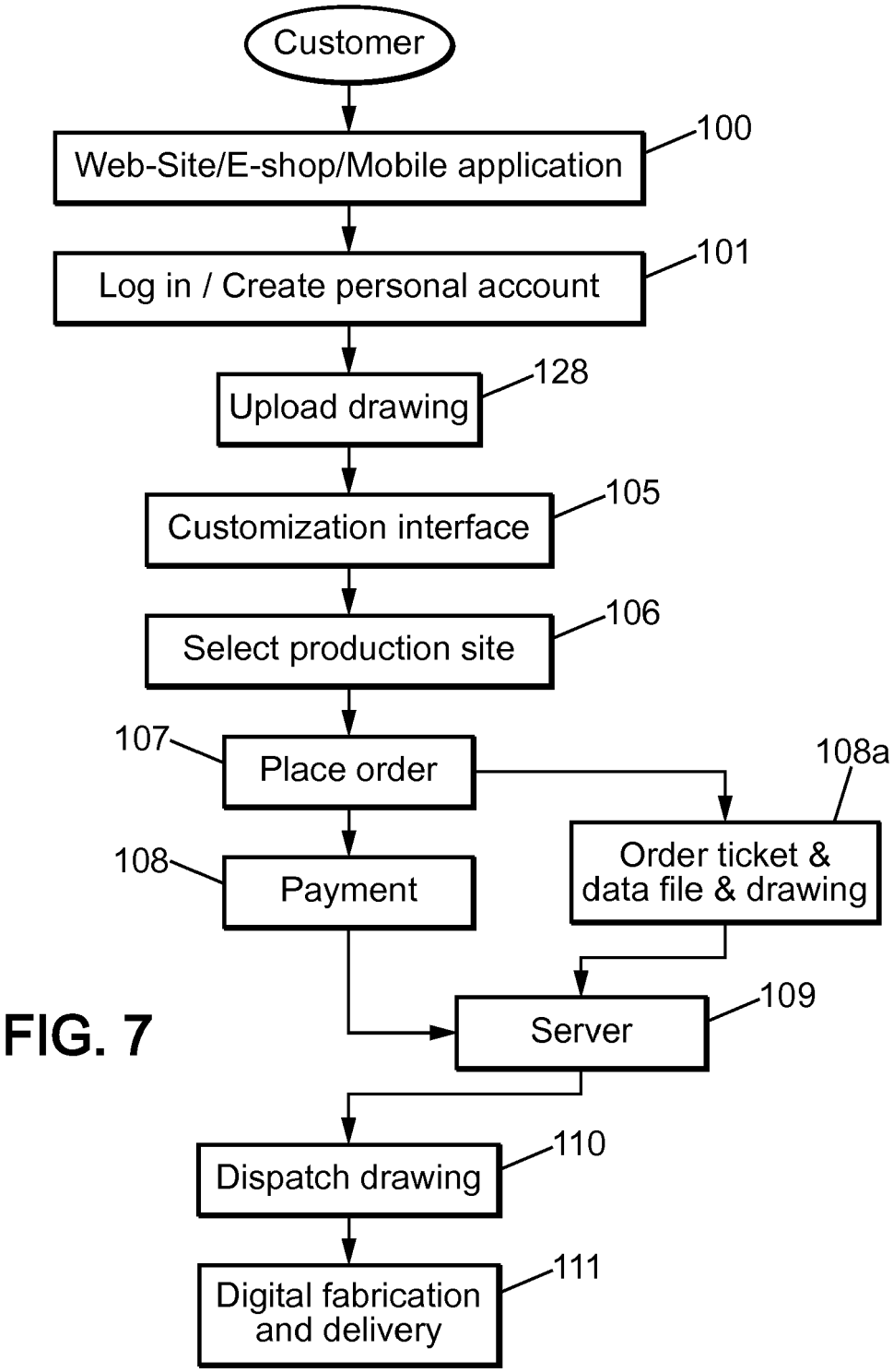

Customer
Web-Site/E-shop/Mobile application
100
Log in / Create personal account
101
Upload drawing
128
Customization interface
105
Select production site
106
107
Place order
108a
108
Payment
Order ticket & data file & drawing
Server
109
Dispatch drawing
110
Digital fabrication and delivery
111

FIG. 7

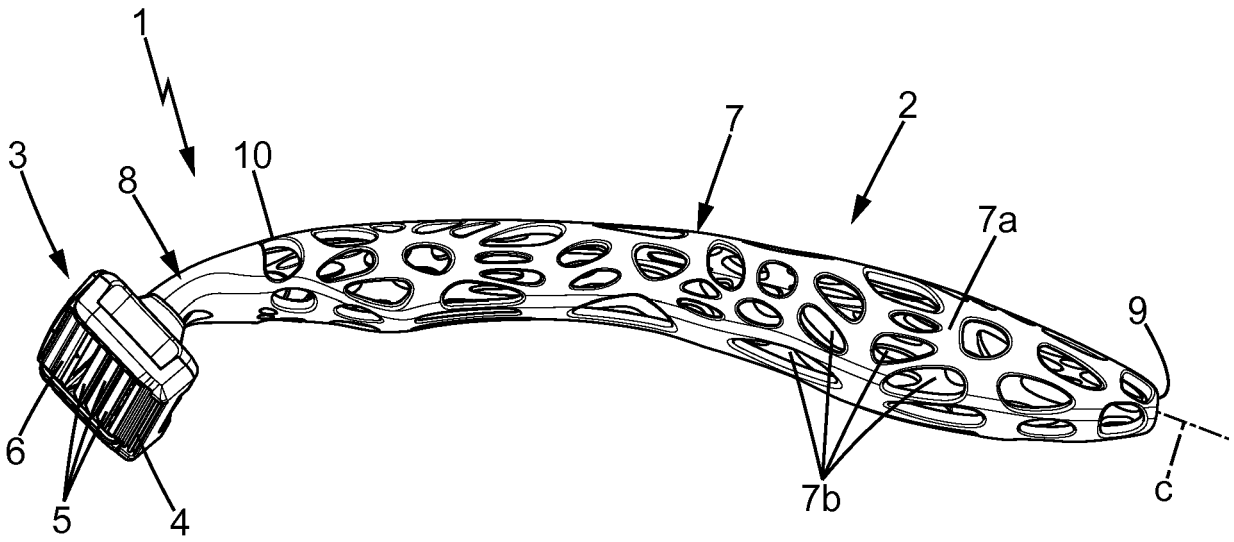
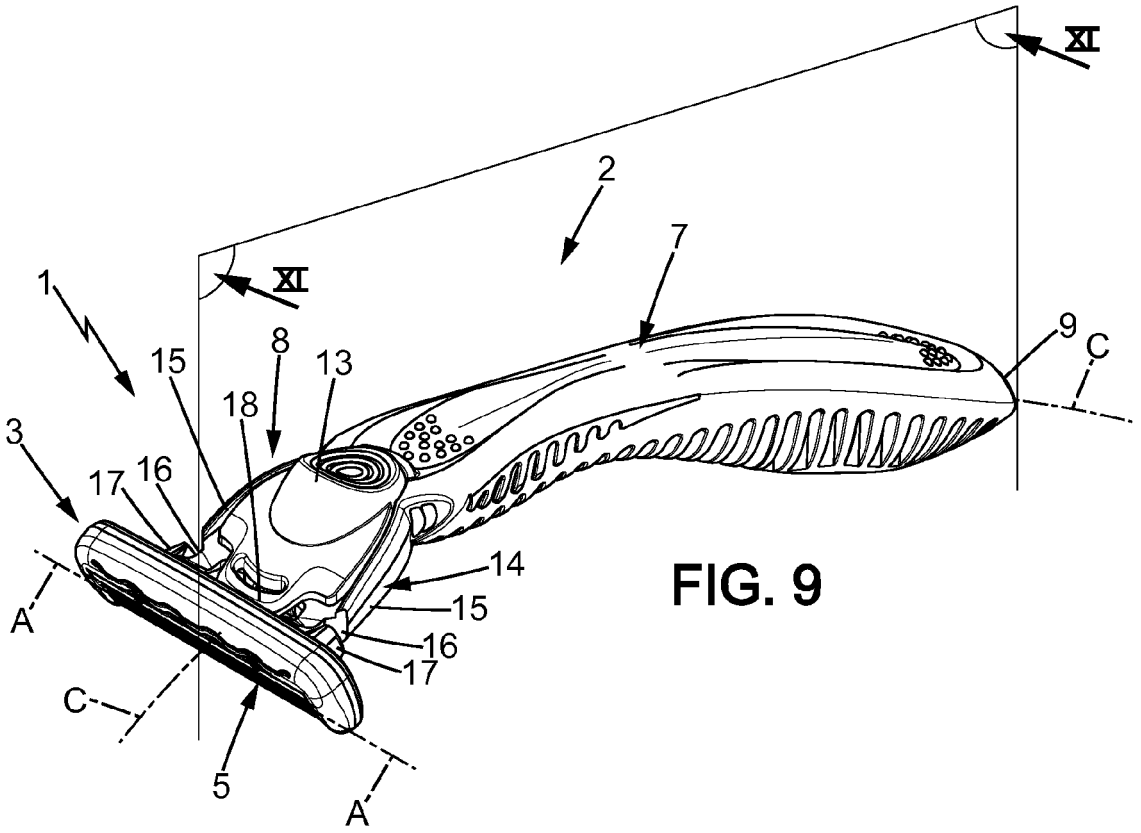


FIG. 8


XI
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XI
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A
C
5
A

FIG. 9

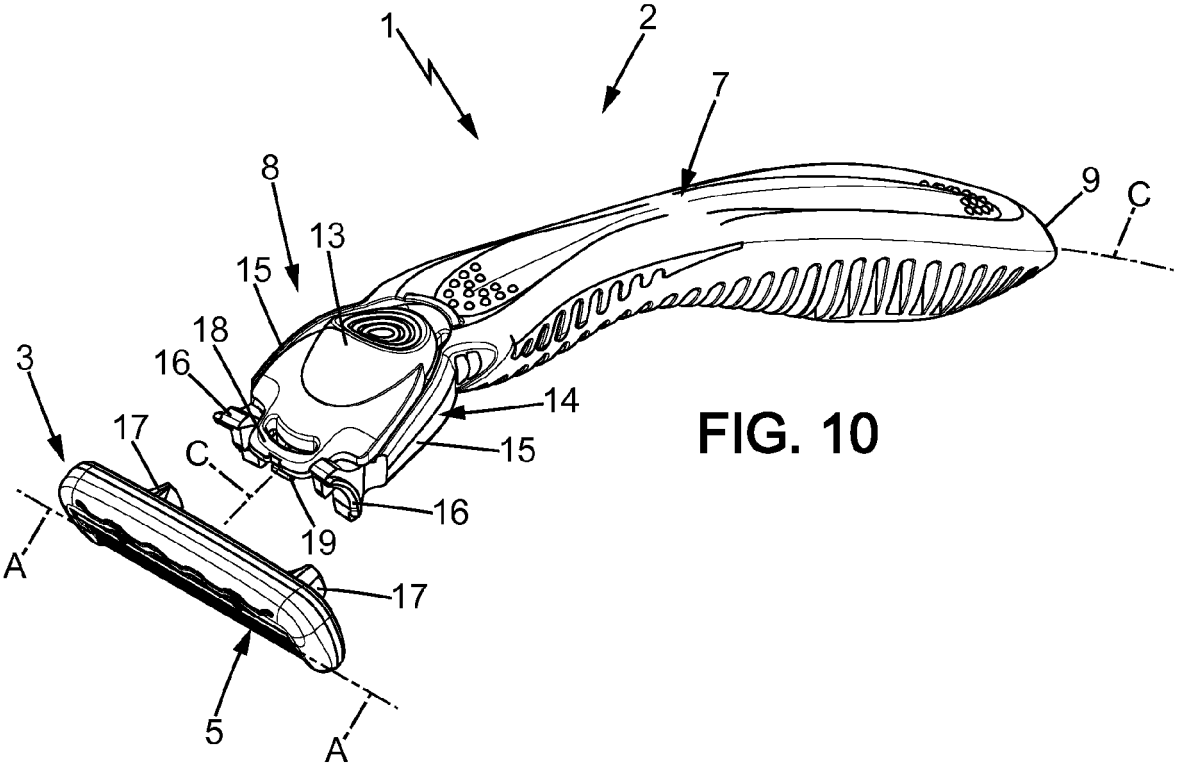
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FIG. 10

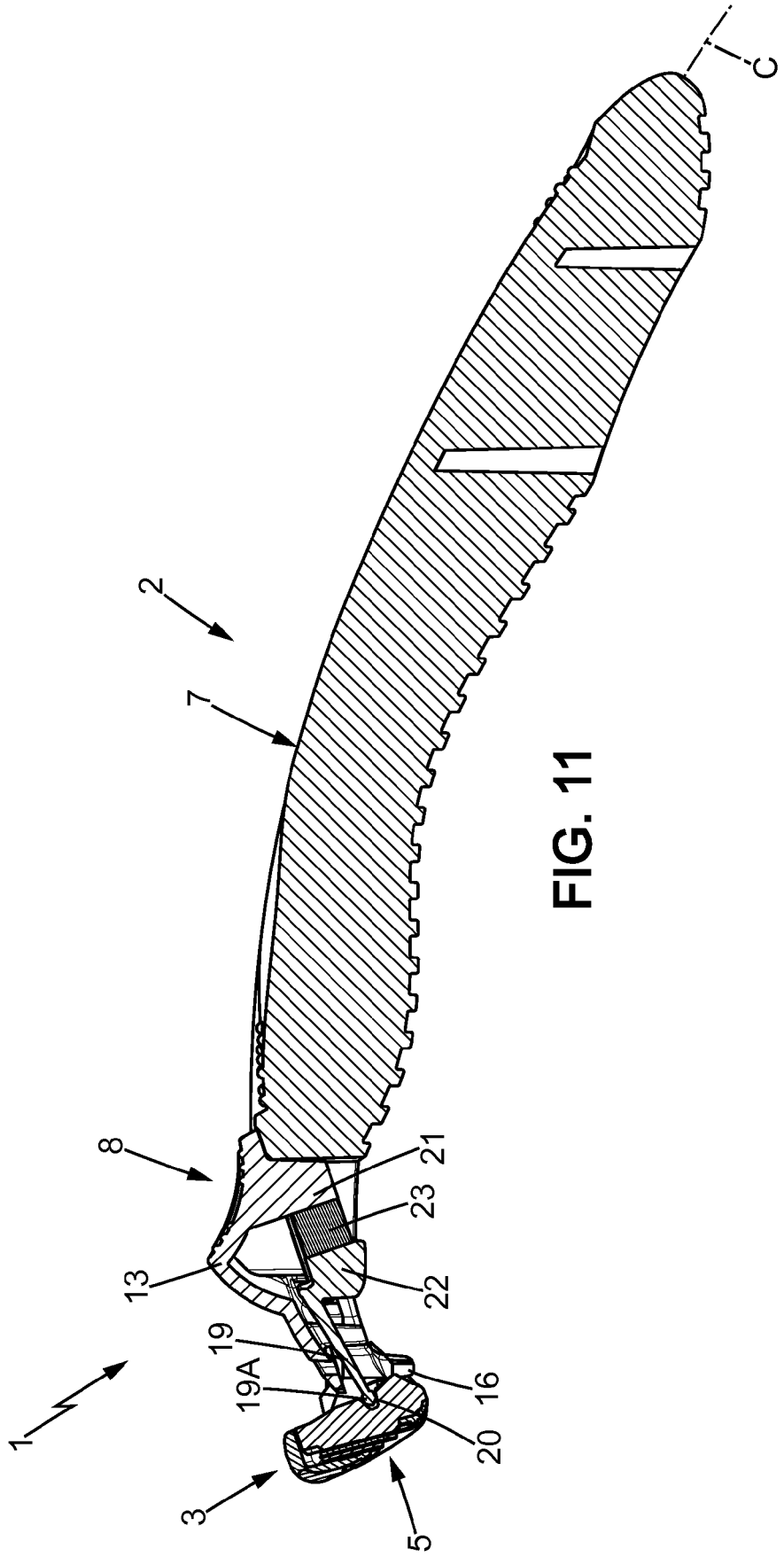

FIG. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 17 16 0417

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2016/121497 A1 (JOHNSON ROBERT HAROLD [US]) 5 May 2016 (2016-05-05) * the whole document *	1-12	INV. B26B21/52
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X	US 2013/081291 A1 (WAIN KEVIN JAMES [GB] ET AL) 4 April 2013 (2013-04-04) * paragraph [0035] *	13,14	
X	EP 2 711 146 A1 (KAI R&D CENTER CO LTD [JP]) 26 March 2014 (2014-03-26)	13	
A	* paragraph [0067] *	14	
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A	* paragraph [0029] *	14	B26B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 June 2018	Cardan, Cosmin

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
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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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Application Number
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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-12

   the subject-matter of the first group of inventions refers to a method of manufacturing a shaver razor handle by digital fabrication

   ---

2. claims: 13, 14

   the subject-matter of the second group of invention relates to a shaver element made of two rigid components joined by an elastomeric material such the relative movement between the two rigid elements is possible

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 16 0417

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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08-06-2018

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REFERENCES CITED IN THE DESCRIPTION

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