(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 088 948 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
16.11.2022 Bulletin 2022/46

(21) Application number: **22172925.4**

(22) Date of filing: **12.05.2022**

(51) International Patent Classification (IPC):
B44B 3/06 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B44B 3/065

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **12.05.2021 IT 202100012221**

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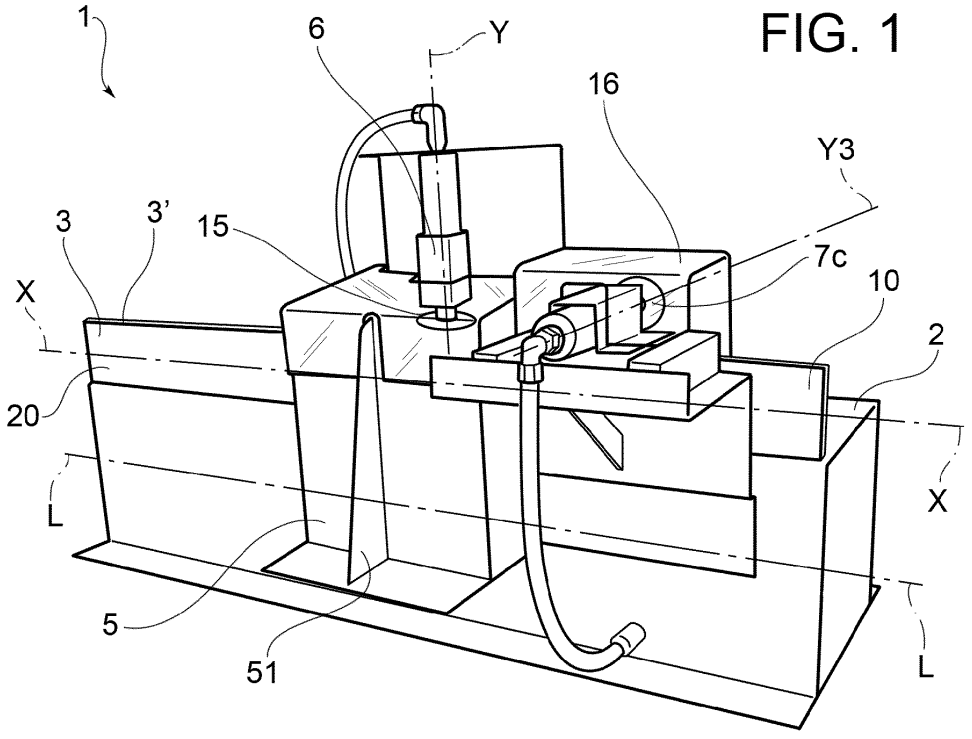
(54) **INCISION MACHINE FOR FOOD PRODUCT TRACKING LABELS**

(57) The invention consists of an incision machine (1) suitable for incising food product tracking labels, comprising a machine body (2) which has a substantially longitudinal development along a body axis (L-L); a loader (3) supported or obtained in the machine body (2), wherein said loader (3) extends longitudinally along a loader axis (X-X), parallel to the body axis (L-L), wherein said loader (3) forms a guide channel (3') suitable for housing a cartridge (50) of labels (52) slidingly and with shape coupling, wherein said loader (3) extends between a first end (10) and a second end (20); and at least one incision station (6) supported by said machine body (2) and provided with at least one incision blade (15) suitable for incising the cartridge (50) of labels (52) when said cartridge (50) is advanced along said loader (3) from said first end (10) to said second end (20).

FIG. 1



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Description

[0001] An object of the present invention is a label incision machine suitable for making incisions on food product tracking labels, in particular for fish.

[0002] The label incision method is also an object of the present invention.

[0003] The proposed incision machine falls particularly, but not exclusively, in the context of the organization of the farmed fish farming, processing and distribution chain.

[0004] In general, the labels are used to track food products, in particular fish products, so as to allow the entire path of the product that arrives on a plate to be determined, allowing the customer to recognize the farming methods, giving quality answers to the consumer's legitimate requests. The labels may contain various information concerning the product itself or the production chain.

[0005] A multiplicity of machines used to incise fish labels are known in the background art.

[0006] The machines used to incise such labels in the background art generally consist of several incision stations, they are thus bulky, difficult to transport, slow and expensive.

[0007] It is the object of the present invention to propose a label incision machine and a label incision method capable of overcoming the drawbacks of the machines of the background art.

[0008] It is another object of the present invention to provide an incision machine capable of incising labels in a simple, precise and energy-efficient manner.

[0009] Such objects are achieved with a label incision machine according to claim 1. Furthermore, such objects are achieved by the label incision method according to claim 14. The claims dependent thereon show preferred variants implying further advantageous aspects.

[0010] The features and advantages of the label incision machine according to the present invention will however become apparent from the following description of preferred embodiments thereof, given by way of indication and not by way of limitation, with reference to the accompanying drawings, in which:

- figure 1 is a perspective view of an incision machine according to the present invention, in accordance with a preferred embodiment;
- figure 2 is a perspective view of a portion of the incision machine according to the present invention, in accordance with a preferred embodiment;
- figure 3 is a perspective view of a set of food product labels;
- figure 4 is a side view of a component of the incision machine according to the present invention, in accordance with a preferred embodiment.

[0011] In accordance with the accompanying drawings, the reference numeral 1 is used to overall indicate an incision machine suitable for incising food product tracking labels, in particular fish, according to the present invention. The label incision method fully described below is in turn an object of the present invention.

[0012] The machine 1 is suitable for incising a cartridge 50 of labels 52.

[0013] During the present discussion, the term "cartridge of labels" (figure 3) is intended as a plurality of labels 52 in which the rear face of a label is made to match the front face of the label arranged in succession. The incision machine 1 that will be described below is capable of incising a cartridge 50 comprising a very large number of labels 52, e.g., equal to 6,000. The incision machine 1 is suitable for incising a very large number of labels 52 simultaneously.

[0014] In accordance with the invention, the incision machine 1 comprises a machine body 2 which has a substantially longitudinal development along a body axis L-L. For example, said machine body 2 is made using a metal sheet suitably bent, welded and riveted to form a container.

[0015] In an embodiment, the machine body 2 has the shape of a parallelepiped.

[0016] For example, the machine body 2 is made of steel.

[0017] According to the invention, the incision machine 1 comprises a loader 3 supported by, or obtained in the machine body 2. Such a loader 3 extends longitudinally along a loader axis X-X, parallel to the body axis L-L. Such a loader 3 forms a guide channel 3' suitable for housing a cartridge 50 of labels 52 in sliding manner and with shape coupling (figure 4).

[0018] In particular, the labels 52 of the cartridge 50 comprise a support portion 52a and an information portion 52b. The support portion 52a is for example in the form of a stem with a pointed end to be inserted in the food product to be tracked. The information portion 52b, which extends from the support portion 52a, for example from the opposite side with respect to the pointed end, is the one that contains the tracking information to be incised. Furthermore, the information portion 52b comprises a perimeter contour 520.

[0019] In an embodiment, the information portion 52b reports information in a distributed manner along the perimeter contour 520 (with the exception of the connection zone to the support portion 52a). In the depicted example, the information portion 52b has a rectangular shape and the information is imprinted along the three sides thereof, i.e., on an upper side (e.g., horizontal, considering the cartridge 50 housed in the loader 3) and on two opposite sides (e.g., vertical).

[0020] In accordance with the invention, the loader 3 extends between a first end 10 and a second end 20.

[0021] In accordance with the invention, the incision machine 1 comprises at least one incision station 6 supported by said machine body 2 and provided with at least one incision blade 15. Such an incision blade 15 is suitable for incising the cartridge of labels when said car-

tridge is advanced along said loader 3 from said first end 10 to said second end 20.

[0022] According to an embodiment, the loader 3 comprises a preloaded spring suitable for advancing the cartridge 50 along the guide channel 3'.

[0023] In accordance with the invention, the machine body 2 comprises at least one support structure 5 which supports the at least one incision station 6.

[0024] In accordance with an embodiment, the guide channel 3' is counter-shaped with respect to the support portion 52a, so as to leave the information portion 52b completely exposed to be incised by the at least one incision blade 15.

[0025] According to an embodiment, the at least one incision blade 15 incises the information portion 52b of the labels 52 at a point along the perimeter contour 520.

[0026] In accordance with an embodiment, the at least one incision station 6 comprises a disk 7, in which said disk 7 rotates around a disk rotation axis Y-Y. The at least one incision blade 15, which moves integrally with said disk 7, is mounted on such a disk 7.

[0027] In accordance with an embodiment, the at least one incision blade 15 can be adjusted both in height and depth so as to vary the incision on the label 52. In other words, such at least one blade can be brought closer to or farther away from the loader axis X-X in the longitudinal direction with respect to the disk rotation axis Y-Y.

[0028] In accordance with an embodiment, the at least one incision blade 15 can translate in a longitudinal direction with respect to the loader axis X-X.

[0029] In an embodiment, the incision machine 1 comprises a compressor. Preferably, such a compressor is housed inside the machine body 2.

[0030] In accordance with an embodiment, such a disk 7 is driven by compressed air fed by said compressor.

[0031] According to an embodiment, the at least one incision blade 15 is inserted within a partition 16, preferably in polymeric material, for example polycarbonate. Such a partition is useful for the safety of operators and to prevent the chips of the incised labels from dispersing in the surrounding environment.

[0032] In a preferred embodiment, the incision machine 1 comprises three incision stations 6.

[0033] According to an embodiment, such three incision stations 6 are positioned spaced along the body axis L-L.

[0034] According to an embodiment, the support structures 5 are plate-shaped and are anchored to the machine body 2 for example by screws and bolts.

[0035] In accordance with an embodiment, the support structures 5 are made of steel.

[0036] In accordance with an embodiment, such support structures 5 comprise reinforcing metal gussets 51.

[0037] In an embodiment, a first disk 7a and a second disk 7b are rotating about a respective first disk rotation axis Y1-Y1 and second disk rotation axis Y2-Y2. Said first disk rotation axis Y1-Y1 and said second disk rotation axis Y2-Y2 are parallel to each other and are orthogonal with respect to a third disk rotation axis Y3-Y3 of a third disk 7c.

[0038] According to a preferred embodiment, the loader 3 is interposed between the first disk 7a and the second disk 7b and the first disk 7a and the second disk 7b are arranged frontally. In other words, the first disk 7a and the second disk 7b are positioned on the two opposite sides of the loader 3 with respect to the loader axis X-X.

[0039] In an embodiment, the loader axis X-X is substantially orthogonal to the first and second disk rotation axis Y1-Y1, Y2-Y2 and substantially orthogonal to the third disk rotation axis Y3-Y3.

[0040] In an embodiment, the at least three incision blades 15 of the respective three disks 7a, 7b, 7c incise the information portion 52b of the labels 52 each at a different point along the perimeter contour 520.

[0041] In a preferred embodiment, the at least three incision blades 15 can be moved towards or away from the loader axis X-X in the longitudinal direction with respect to the first and second disk rotation axis Y1-Y1, Y2-Y2 and/or in the longitudinal direction with respect to the third disk rotation axis Y3-Y3.

[0042] In an embodiment, the label incision machine 1 can be connected to a computer so as to interface, for example, with a management software and thus be able to accelerate the verification and incision times.

[0043] In a preferred embodiment, such an incision machine 1 is connected to a computer via a wireless communication technology, for example Bluetooth.

[0044] In accordance with an embodiment, the incision machine 1 comprises a battery. In accordance with an embodiment, such a battery is housed in the machine body 2 and ensures energy autonomy to the machine 1.

[0045] As mentioned, the label incision method is further an object of the present invention.

[0046] In particular, such an incision method comprises the steps of:

a) providing an incision machine 1 according to the invention;

b) providing a cartridge 50 of labels 52 in which the labels have a support portion 52a and an information portion 52b, in which the information portion 52b is substantially rectangular in shape and comprises four sides;

c) inserting the cartridge 50 from the first end 10 of the loader 3 so that the support portion 52a is inserted in the guide channel 3' and so as to leave three sides of said information portion 52b completely exposed to be incised by said at least one incision blade 15;

d) advancing the cartridge 50 along the loader 3;

e) operating the at least one incision blade 15 so as to incise a side of the information portion 52b when the incision blade 15 intercepts the cartridge 50;

f) sliding the cartridge 50 out of the second end 20 of the loader 3.

[0047] According to a preferred embodiment, in step e, the at least three incision blades 15 of the respective three disks 7a, 7b, 7c are operated, so that each incision blade 15 incises a different side of the information portion 52b when each incision blade 15 intercepts the cartridge 50.

[0048] Innovatively, the fish label incision machine of the present invention fully fulfills the intended object. Similarly, the label incision method of the present invention also fully fulfils the intended object.

[0049] Advantageously, the incision machine described allows the labels to be characterized so as to track the food product along the entire production chain, until delivery to the point of sale.

[0050] Advantageously, the labels incised by the machine are easily readable by customers so that they can know the data related to the product, the farming methods and the product quality.

[0051] Advantageously, every part of the incision machine can be easily accessed so that maintenance can be performed.

[0052] Advantageously, the label incision machine is capable of carrying out multiple incisions on a label cartridge. The operation of incising the labels is thus particularly fast, precise, simple and safe for the operator.

[0053] Advantageously, the machine has reduced overall dimensions and a low weight. It is thus easily transportable, even in separate parts which can then be quickly and easily reassembled on site.

[0054] Advantageously, the use of a battery-powered compressor allows using the incision machine even in the open field, for example on board fishing vessels.

[0055] A person skilled in the art may make changes and adaptations to the embodiments of the incision machine according to the invention or can replace elements with others which are functionally equivalent to satisfy contingent needs without departing from the scope of protection of the appended claims. All the features described above as belonging to a possible embodiment can be implemented irrespective of the other embodiments described.

Claims

1. An incision machine (1) suitable for incising food product tracking labels, comprising:

   i) a machine body (2) which has a substantially longitudinal development along a body axis (L-L);
   ii) a loader (3) supported by or obtained in the machine body (2), wherein said loader (3) extends longitudinally along a loader axis (X-X), parallel to the body axis (L-L), wherein said loader (3) forms a guide channel (3') suitable for housing a cartridge (50) of labels (52) slidingly and with shape coupling, wherein said loader (3) extends between a first end (10) and a second end (20) ;
   iii) at least one incision station (6) supported by said machine body (2) and comprising at least one incision blade (15) suitable for incising the cartridge (50) of labels (52) when said cartridge (50) is advanced along said loader (3) from said first end (10) to said second end (20).

2. Incision machine (1) according to claim 1, wherein the labels (52) have a support portion (52a) and an information portion (52b), wherein said information portion (52b) comprising a perimeter contour (520), wherein the guide channel (3') is counter-shaped with respect to said support portion (52a), so as to leave said information portion (52b) completely exposed to be incised by said at least one incision blade (15).

3. Incision machine (1) according to claims 2, wherein the at least one incision blade (15) incises the informative portion (52b) of the labels (52) at a point along said perimeter contour (520).

4. Incision machine (1) according to any one of the preceding claims, wherein the loader (3) comprises a preloaded spring suitable for advancing the cartridge (50) along the guide channel (3').

5. Incision machine (1) according to any one of the preceding claims, wherein the at least one incision station (6) comprises a disk (7), wherein said disk (7) rotates around a disk rotation axis (Y-Y), wherein the at least one incision blade (15), which moves integrally with said disk (7), is mounted on said disk (7),

6. Incision machine (1) according to claim 5, wherein the at least one incision blade (15) is moved towards or away from the loader axis (X-X) in the longitudinal direction with respect to the disk rotation axis (Y-Y), wherein the at least one incision blade (15) translates in the longitudinal direction with respect to the loader axis (X-X).

7. Incision machine (1) according to claim 5 or 6, comprising a compressor, wherein said disk (7) is driven by compressed air fed by said compressor.

8. Incision machine (1) according to any one of the preceding claims, comprising three incision stations (6).

9. Incision machine (1) according to claims 5 and 8, wherein a first disk (7a) and a second disk (7b) are rotating about respective first disk rotation axis (Y1-Y1) and second disk rotation axis (Y2-Y2), wherein said first disk rotation axis (Y1-Y1) and said second disk rotation axis (Y2-Y2) are parallel to each other and are orthogonal with respect to a third disk rota-

tion axis (Y3-Y3) of a third disk (7c), wherein the loader (3) is interposed between the first disk (7a) and the second disk (7b) and wherein the first disk (7a) and the second disk (7b) are arranged frontally.

10. Incision machine (1) according to claim 9, wherein the loader axis (X-X) is substantially orthogonal to the first and second disk rotation axis (Y1-Y1, Y2-Y2) and substantially orthogonal to the third disk rotation axis (Y3-Y3).

11. Incision machine (1) according to claim 9 or 10, wherein the at least three incision blades (15) of the respective three disks (7a, 7b, 7c) incise the information portion (52b) of the labels (52) each at a different point along said perimeter contour (520).

12. Incision machine (1) according to claim 9, 10 or 11, wherein the at least three incision blades (15) are moved towards or away from the loader axis (X-X) in the longitudinal direction with respect to the first and second disk rotation axis (Y1-Y1, Y2-Y2) and/or in the longitudinal direction with respect to the third disk rotation axis (Y3-Y3).

13. Incision machine (1) according to any of the preceding claims, comprising at least one support structure (5) which supports the at least one incision station (6).

14. An incision method suitable for incising food product tracking labels, comprising the steps to:

a) provide an incision machine (1) according to any one of claims 1 to 13;
b) provide a cartridge (50) of labels (52) wherein the labels have a support portion (52a) and an information portion (52b), wherein the information portion (52b) is substantially rectangular in shape and comprises four sides;
c) insert the cartridge (50) through the first end (10) of the loader (3) so that the support portion (52a) is inserted inside the guide channel (3') and so as to leave three sides of said informative portion (52b) fully exposed to be incise by said at least one incision blade (15) ;
d) advance the cartridge (50) along the loader (3);
e) operate the at least one incision blade (15) so that it incises at least one side of the information portion (52b) when the incision blade (15) intercepts the cartridge (50);
f) slide the cartridge (50) out of the second end (20) of the loader (3).

15. Incision method according to claims 11 and 14, wherein in step e), the at least three incision blades (15) of the respective three disks (7a, 7b, 7c) are operated, so that each incision blade (15) incises a different side of the information portion (52b) as each incision blade (15) intercepts the cartridge (50).

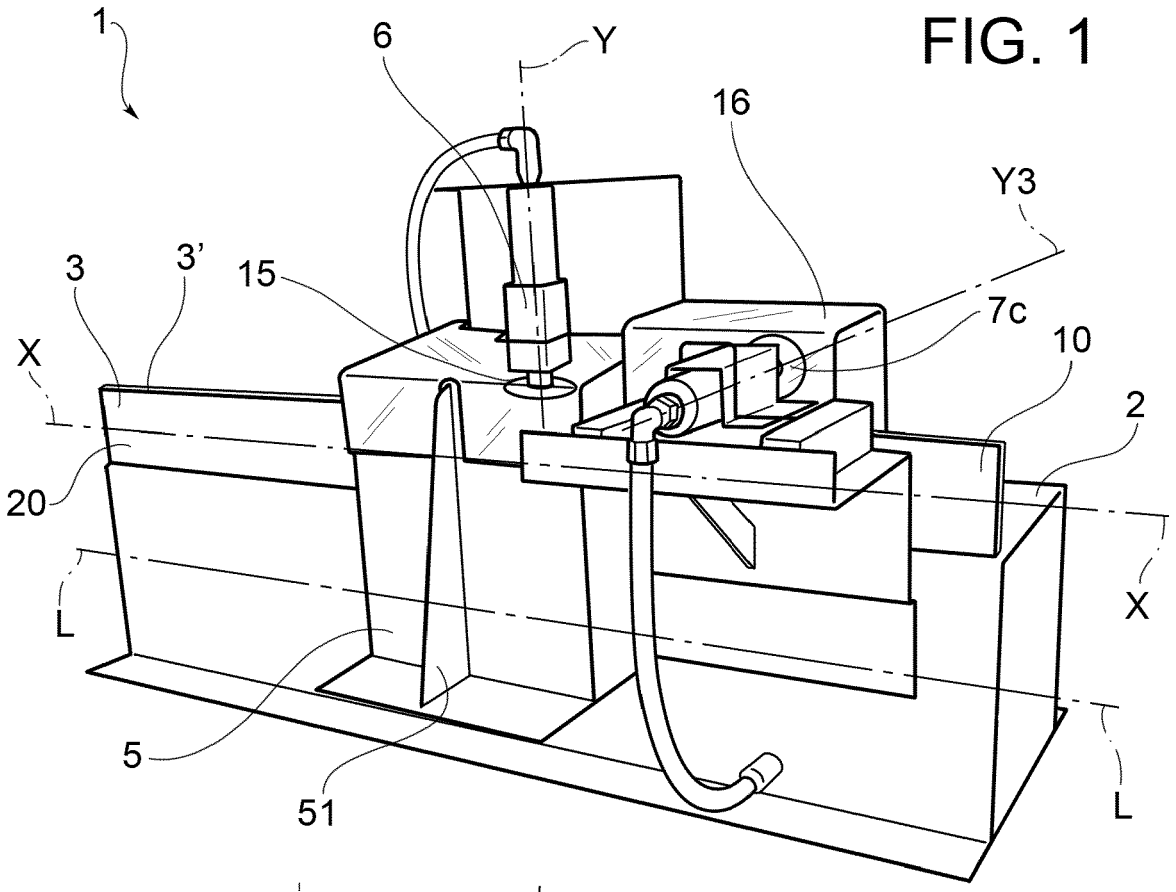

FIG. 1

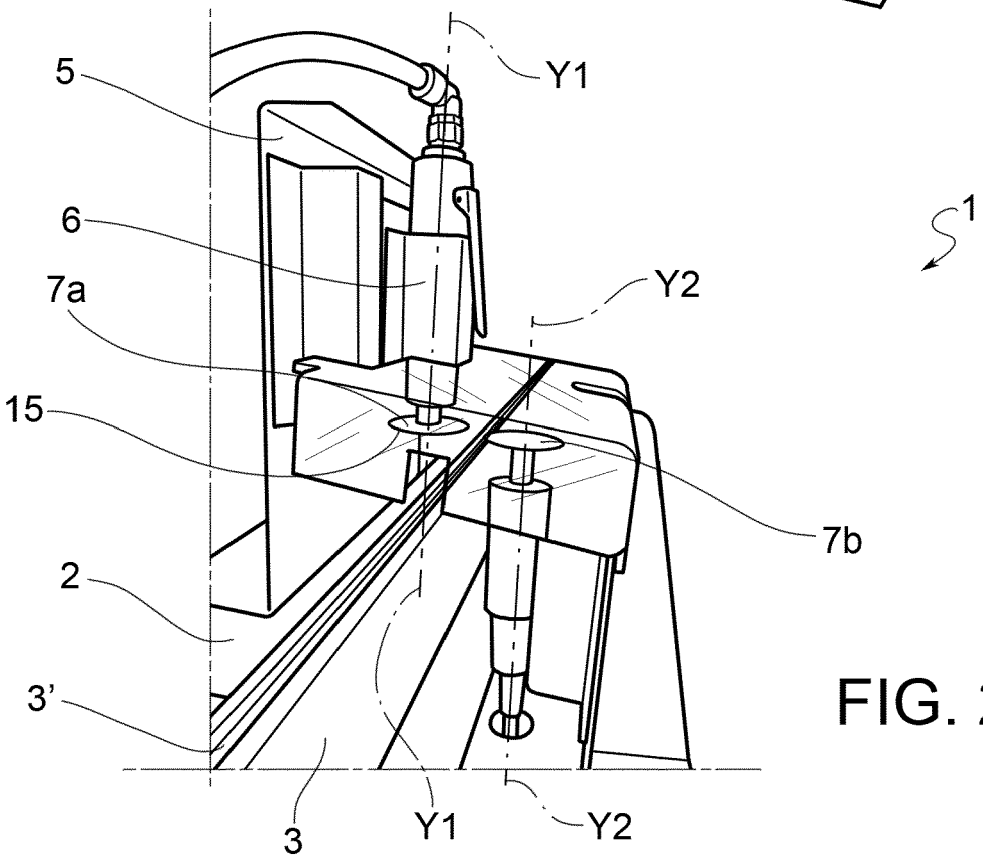

FIG. 2

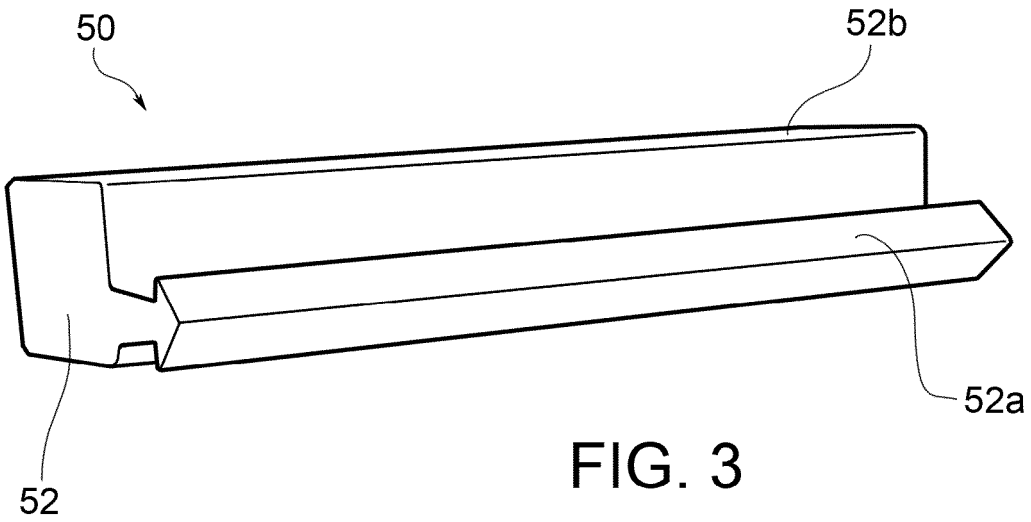

FIG. 3

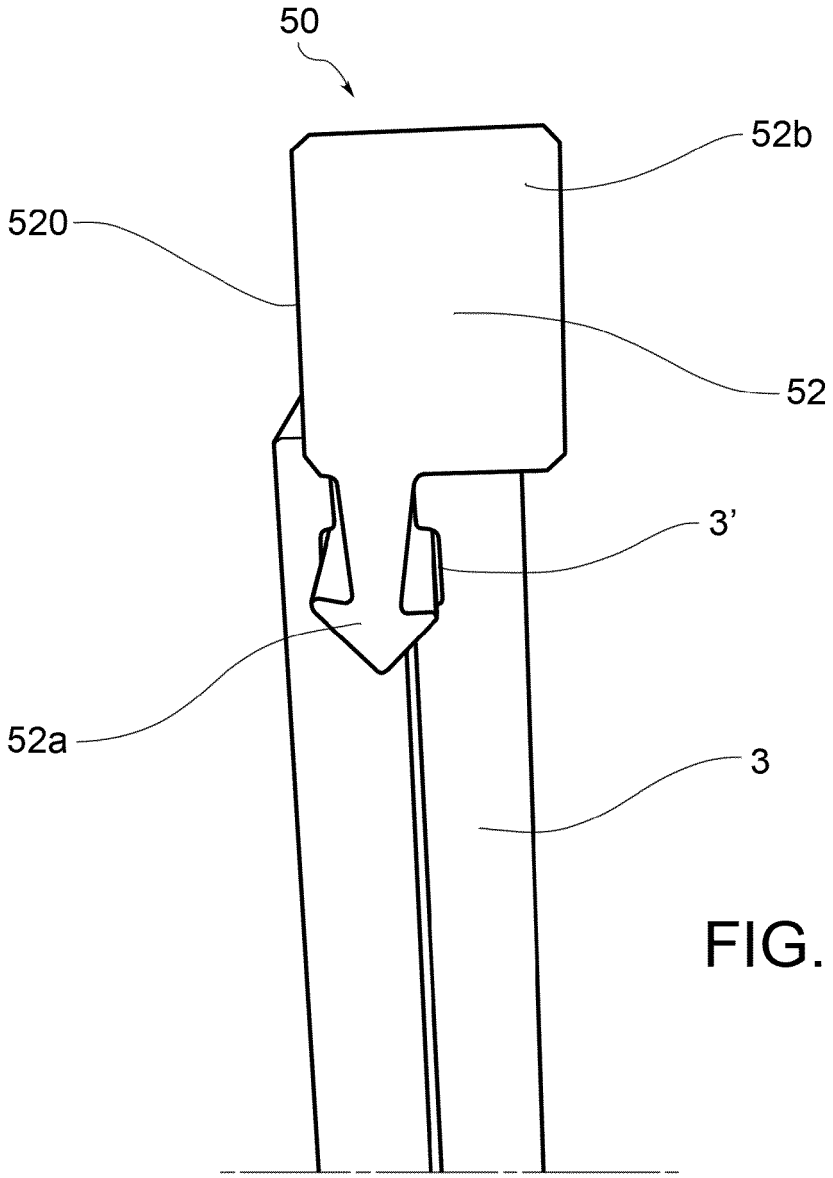

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 22 17 2925

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 September 2022	Björklund, Sofie

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