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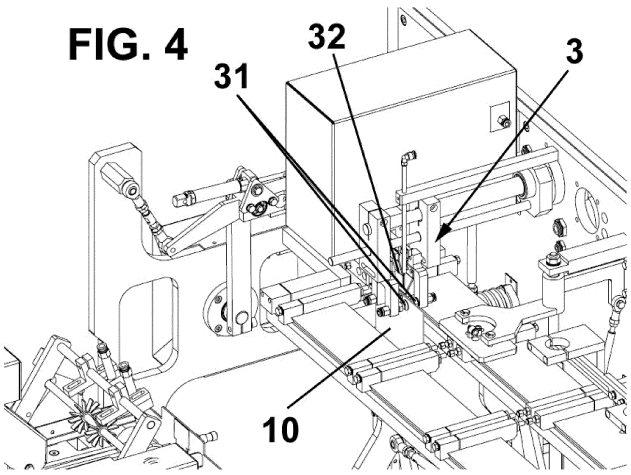
(54) MACHINE FOR THE PACKAGING OF PRODUCTS IN FLEXIBLE PREFORMED CONTAINERS WITH A SEALING ELEMENT

(57) The packaging machine for packaging products in preformed flexible containers with closing element comprises a feeding station (1), which feeds the preformed flexible containers (10) with closing element; a dosing station, which doses a product into the containers; and a sealing station (6), which seals the container with the product inside, wherein the packaging machine also comprises an opening station (3), in which said container (10) is opened, said opening station (3) being positioned before said dosing station.

It allows the container to be fed with the closing element open or closed, as the opening station allows the closing element to be opened if it is closed, increasing the productivity of the packaging machine.

FIG. 4



EP 3 974 327 A1

Description

[0001] The present invention relates to a machine for packaging products in preformed flexible containers with a closing element.

Background of the invention

[0002] Different types of packaging are available on the market, each one adapted to a specific use. In particular, on the market there is a packaging commonly known as "Doypack®", which is usually used as a single-use packaging for granulated or liquid products, and has the feature that it includes a closing element.

[0003] This closing element is usually of the type known as a "Zipper®", which is commonly used for powdered, granulated, hygienic, cleaning or food products. This type of closure is a snap closure along a line.

[0004] In addition, this type of container may, if desired, comprise a nozzle formed in the container itself closed by a cap.

[0005] In order to achieve maximum packaging productivity, automatic packaging machines are used, comprising a dosing station for dosing a product into the container and a sealing station in which the filled container is sealed.

[0006] When using "Doypack®" containers, the presence of this closing element makes the packaging operation more difficult, and it is always necessary to supply the containers to the machine with the closing element open, with the consequent problem that this entails, since during production the closing element can remain closed.

[0007] Therefore, an objective of the present invention is to provide a packaging machine which enables products to be packaged quickly and easily in such containers provided with a closing element.

Description of the invention

[0008] With the packaging machine of the invention, the above-mentioned disadvantages are solved, presenting other advantages which will be described below.

[0009] The machine for packaging products in preformed flexible containers with closing element according to the present invention comprises:

- a feeding station that feeds the preformed flexible containers with closing element;
- a dosing station, which doses a product into the containers; and
- a sealing station, which seals the container with the product inside it,

wherein the packaging machine also comprises an opening station, in which said container is opened, said opening station being positioned before said dosing station.

[0010] Thanks to this feature, the container can be fed with the closing element open or closed, as the opening station allows to open the closing element in case it is closed, increasing the productivity of the packaging machine.

[0011] Advantageously, said opening station comprises a pair of suction elements, such as two suction cups, which are fixed to two opposite parts of the container.

[0012] Furthermore, said opening station also preferably comprises a pair of opening grippers, which open said container before dosing. Said grippers, for example, are a pair of plates which are inserted through a mouth of said container and are moved apart from each other to open the container.

[0013] In the machine for packaging products in preformed flexible containers with closing element according to the present invention, said container feeding station preferably comprises a conveyor belt.

[0014] Said container feeding station also preferably comprises a positioning sensor, which detects the position of a container and can determine whether said container is in the correct position.

[0015] The machine for packaging products in preformed flexible containers with closing element according to the present invention also preferably comprises a positioning arm carrying a bag from the container feeding station to the opening station. Said positioning arm is advantageously tiltable from a container pick-up position at the container feeding station to a container delivery position to the opening station.

[0016] Furthermore, advantageously said container feeding station comprises suction elements for lifting the front end of the container to be held by said positioning arm.

[0017] The machine for packaging products in preformed flexible containers with closing element according to the present invention may also comprise a closing element feeding station.

[0018] According to a preferred embodiment, said closing element feed station comprises a flap hinged between an open position allowing the passage of a closing element and a closed position in which it prevents the passage of at least one closing element, a locking piston for locking at least one closing element, and/or grippers for holding a closing element.

[0019] Furthermore, said sealing station preferably comprises sealing jaws.

[0020] Said closing element is a plug and/or a zipper.

Brief description of the drawings

[0021] For a better understanding of what has been explained above, some drawings are included in which, schematically and only as a non-limiting example, a practical case of embodiment is shown.

Figure 1 is a perspective view of the packaging machine according to the present invention during the feeding of a preformed flexible container;

Figures 2 and 3 are perspective views of the packaging machine according to the present invention during the transfer of a container from the container feeding station to the opening station;

Figure 4 is a perspective view of the packaging machine according to the present invention with a container in its initial position in the opening station;

Figure 5 is a perspective view of the packaging machine according to the present invention with a container in its open position at the opening station;

Figure 6 is a perspective view of the closing element feeding station with the hinged flap in its closed position;

Figure 7 is a perspective view of the closing element feeding station with the hinged flap in its open position; and

Figure 8 is a perspective view of the packaging machine according to the present invention, wherein is shown the sealing station with its sealing jaws in the open position.

Description of a preferred embodiment

[0022] The figures show the most relevant stations of the packaging machine according to the present invention, although the last stations, which are the dosing and sealing stations (for the embodiment of figures 1 to 5), are not shown, for reasons of simplicity and because they are conventional dosing and sealing stations.

[0023] It should be noted that this packaging machine is specially designed for use with containers of the type comprising a closing element, commonly known in the industry as a "Zipper®". In other words, it is designed for use with containers known as "Doypack®".

[0024] The main advantage of the packaging machine according to the present invention is that it allows to feed the containers with their closing element closed or open, since in either case the machine will open said container before its dosing with the desired product.

[0025] The packaging machine according to the present invention comprises a container feeding station, generally identified by reference numeral 1, comprising a conveyor belt 11, which feeds the containers 10.

[0026] Said conveyor belt 11 may comprise rollers 12 and a sensor, which detects the position of the container 10 and determines whether its position is correct.

[0027] When such position is correct, suction elements 13 hold said container 10 for lifting its front end, which is provided with a mouth, so that a positioning arm 2 is coupled to said end of the container 10.

[0028] Said positioning arm 2 is preferably tiltable and moves the container 10 from the container feeding station 1 to an opening station 3. This movement can be seen in Figures 2 and 3.

[0029] In said opening station 3, the container 10 is placed in the appropriate position as shown in figure 4. In this position, suction elements 31, such as suction cups, are fixed on two opposite portions of the container 10 close to the end provided with said mouth.

[0030] Furthermore, in order to open the container 10, the opening station 3 comprises opening grippers 32, which also open in this way the closing element of the container 10, as shown in figure 5.

[0031] Said opening tongs 32 are preferably formed from plates which are inserted into the mouth of the container 10 for opening.

[0032] Next, although not shown in the figures, the container 10 is taken to a dosing station, where a suitable product is dosed to fill the container 10 and, finally, the container 10 is sealed, with the possibility of fitting a cap, if so desired.

[0033] Figures 6 to 8 show an alternative embodiment of the product packaging machine according to the present invention, which is used in the case where the closing element is a cap, which is placed in a Doypack® type flexible container.

[0034] It should be noted, however, that the same machine may comprise a part for the packaging of Doypack® type flexible packaging products with Zipper® and a part for the packaging of Doypack® type flexible packaging products with cap.

[0035] In this embodiment, the machine comprises a station for feeding closing elements 4, i.e., caps 5.

[0036] In the embodiment shown, in said closing element feeding station 4 the caps are placed one above the other vertically, and a hinged flap 41 closes the feeding of the last cap 5 or cap placed in the lowest position of the stack of caps.

[0037] Furthermore, in order to prevent the feeding of several caps at the same time, said closing element feeding station 4 also comprises a blocking piston 42, which blocks the advancement of the penultimate cap 5 in the cap stack before the opening of the hinged flap 41.

[0038] This closing element feed station 4 also comprises grippers 43 which hold the last cap 5 for placement on the container 10.

[0039] The positioning of the cap 5 on the container 10 is preferably carried out by welding, and at the same time as welding the cap 5 is stretched/closes the container 10 at the top in order to be able to obtain a better welding quality.

[0040] Figure 6 shows the hinged flap 41 in its closed position, while Figure 7 shows it in its open position, allowing the lowering of the last cap 5 from the stack of caps for placement in the container 10.

[0041] The packaging machine also comprises a sealing station 6, which seals the container 10 by means of jaws 61, which in figure 6 the jaws 61 are shown in their closed position, sealing the container 10, whereas in figure 8 they are shown in their open position.

[0042] Once the container 10 has been welded, the

grippers 43 are opened, releasing the cap 5, and they are raised to their former position.

[0043] In addition, the already formed container 10 is transported, awaiting receipt of the next cap 5 to be placed on the next container 10.

[0044] Although reference has been made to a specific embodiment of the invention, it is obvious to a person skilled in the art that the packaging machine described is susceptible of numerous variations and modifications, and that all the details mentioned can be replaced by other technically equivalent ones, without departing from the scope of protection defined by the appended claims.

Claims

1. A machine for packaging products in preformed flexible containers with a closing element, comprising:

   - a feeding station (1) that feeds the preformed flexible containers (10) with closing element;
   - a dosing station, which doses a product into the containers; and
   - a sealing station (6), which seals the container with the product inside it, **characterised in that** the packaging machine also comprises an opening station (3), in which said container (10) is opened, said opening station (3) being positioned before said dosing station.

2. Machine for packaging products in preformed flexible containers with closing element according to claim 1, wherein said opening station (3) comprises a pair of suction elements (31), which are fixed to two opposite sides of the container (10).

3. Machine for packaging products in preformed flexible containers with closing element according to claim 1 or 2, wherein said opening station (3) comprises a pair of opening grippers (32), which open said container (10) before dosing.

4. Machine for packaging products in preformed flexible containers with closing element according to claim 1, wherein said container feeding station (1) comprises a conveyor belt (11).

5. Machine for packaging products in preformed flexible containers with closing element according to claim 1 or 4, wherein said container feeding station (1) comprises a positioning sensor, which detects the position of a container (10).

6. Machine for packaging products in preformed flexible containers with closing element according to any one of the preceding claims, also comprising a positioning arm (2) which carries a container (10) from the container feeding station (1) to the opening station (3).

7. Machine for packaging products in preformed flexible containers with closing element according to claim 6, wherein said positioning arm (2) is tiltable from a container pick-up position at the container feeding station (1) to a container delivery position to the opening station (3).

8. Machine for packaging products in preformed flexible containers with closing element according to claim 1, wherein said container feeding station (1) comprises suction elements (13) for lifting the front end of the container (10).

9. Machine for packaging products in preformed flexible containers with closing element according to claim 1, also comprising a closing element feeding station (4).

10. Machine for packaging products in preformed flexible containers with closing element according to claim 9, wherein said closing element feeding station (4) comprises a flap (41) hinged between an open position allowing the passage of a closing element and a closed position in which it prevents the passage of at least one closing element.

11. Machine for packaging products in preformed flexible packaging with closing element according to claim 9 or 10, wherein said closing element feed station (4) comprises a locking piston (42) for locking at least one closing element.

12. Machine for packaging products in preformed flexible packaging with a closing element according to any one of claims 9 to 11, wherein said closing element feeding station (4) comprises grippers (43) for gripping a closing element.

13. Machine for packaging products in preformed flexible containers with closing element according to claim 1, wherein said sealing station (6) comprises sealing jaws (61).

14. Machine for packaging products in preformed flexible containers with a closing element according to claim 1 or 9, wherein said closing element is a cap (5) and/or a zipper.

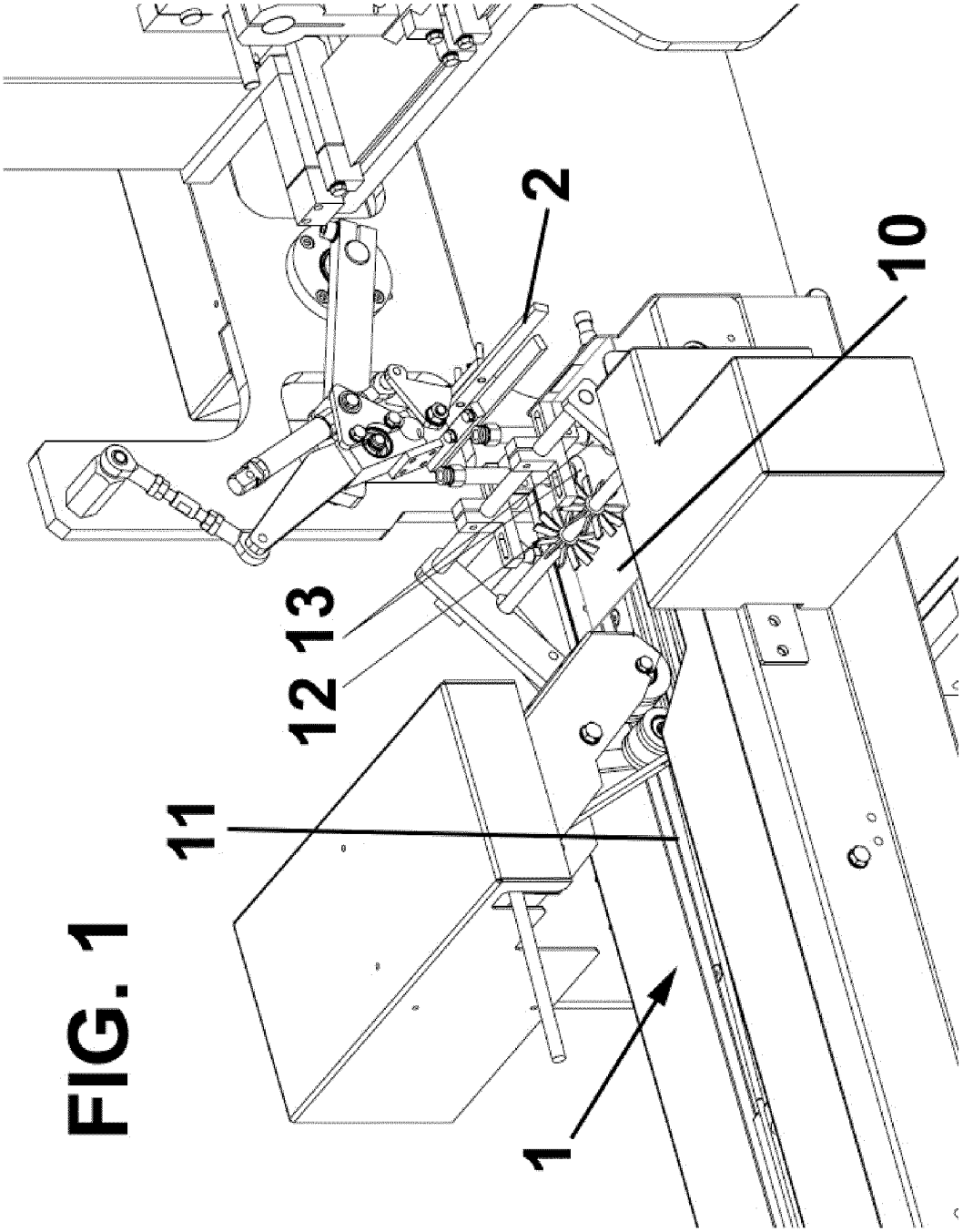


FIG. 1

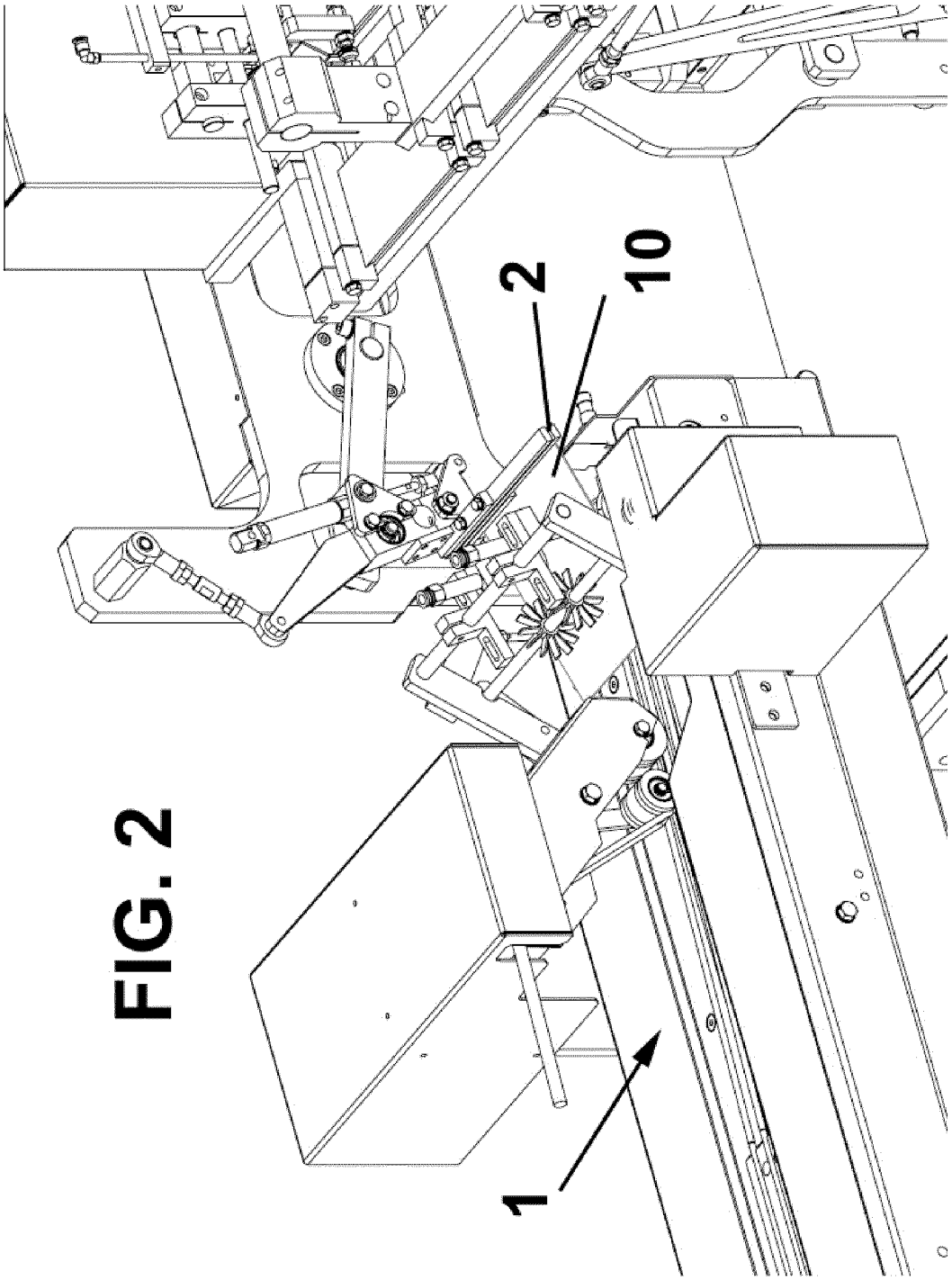


FIG. 2

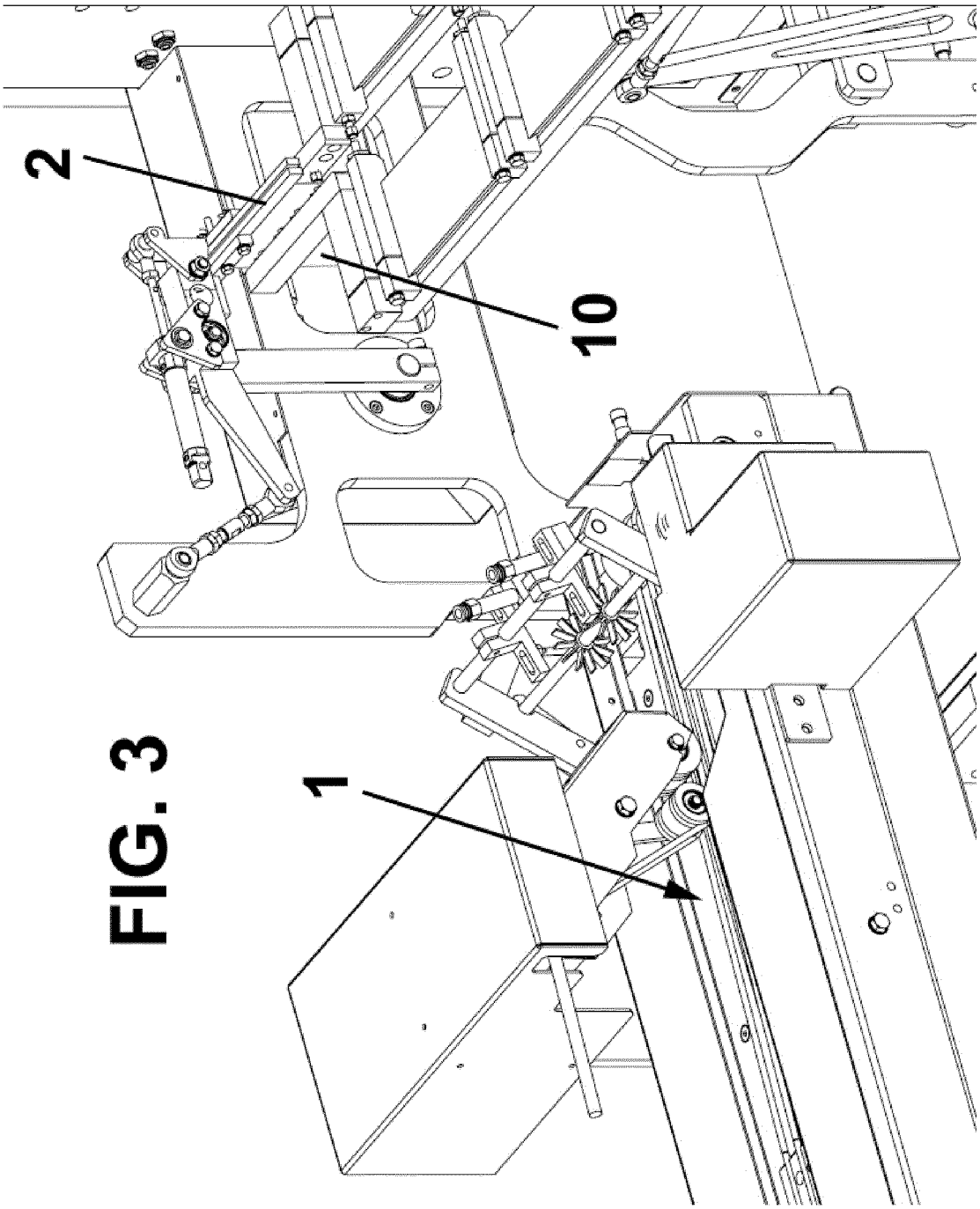


FIG. 3

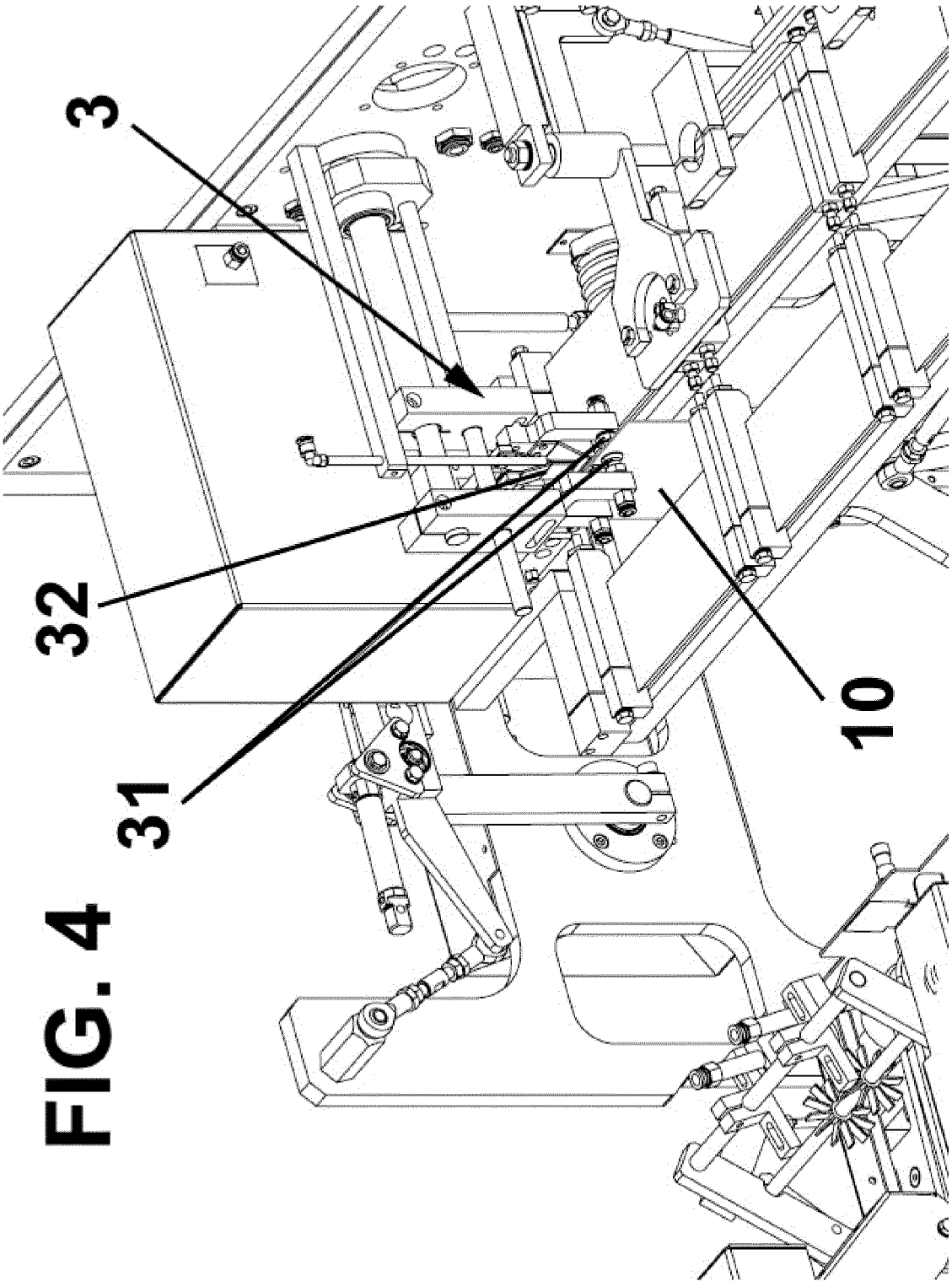


FIG. 4

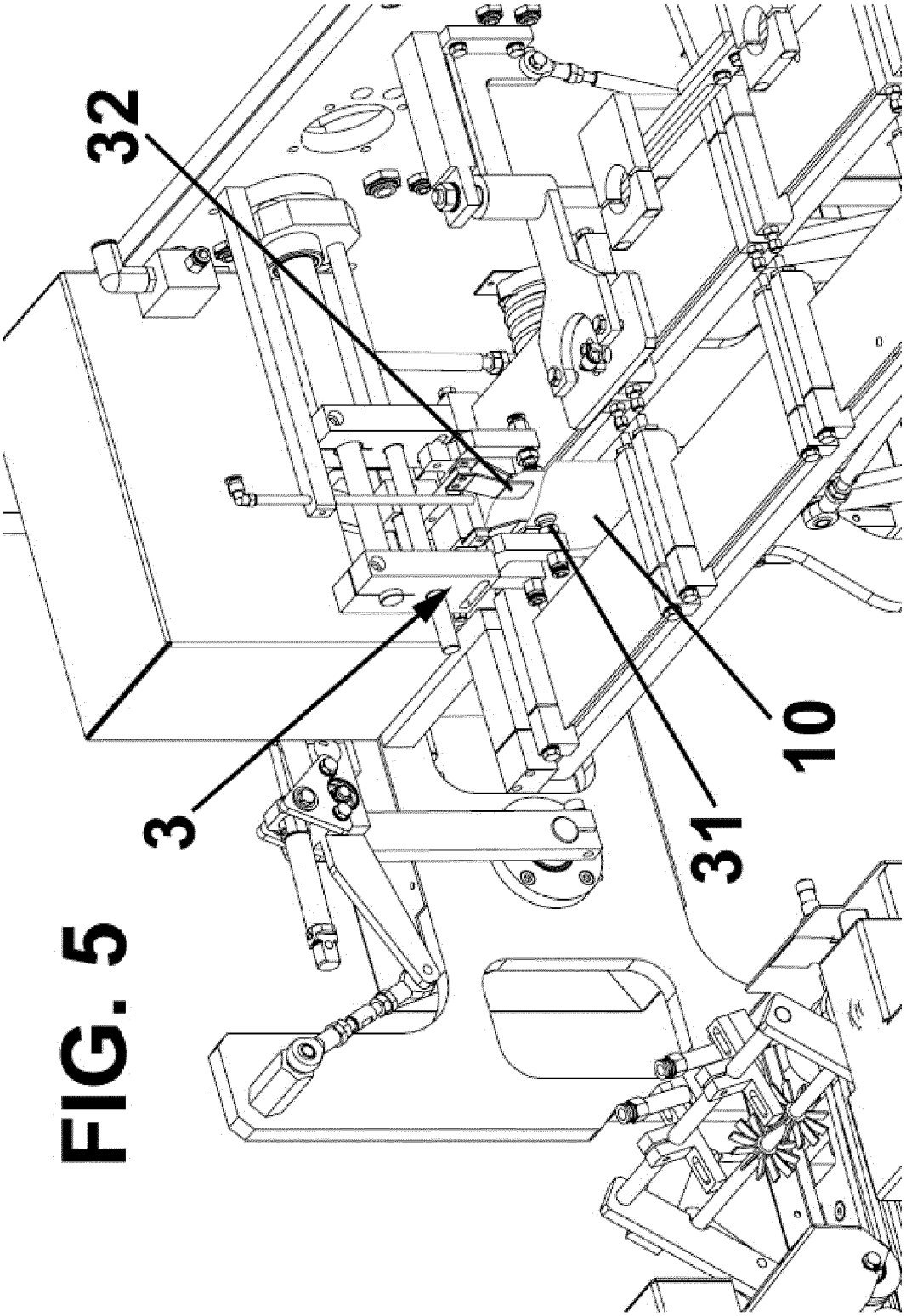


FIG. 5

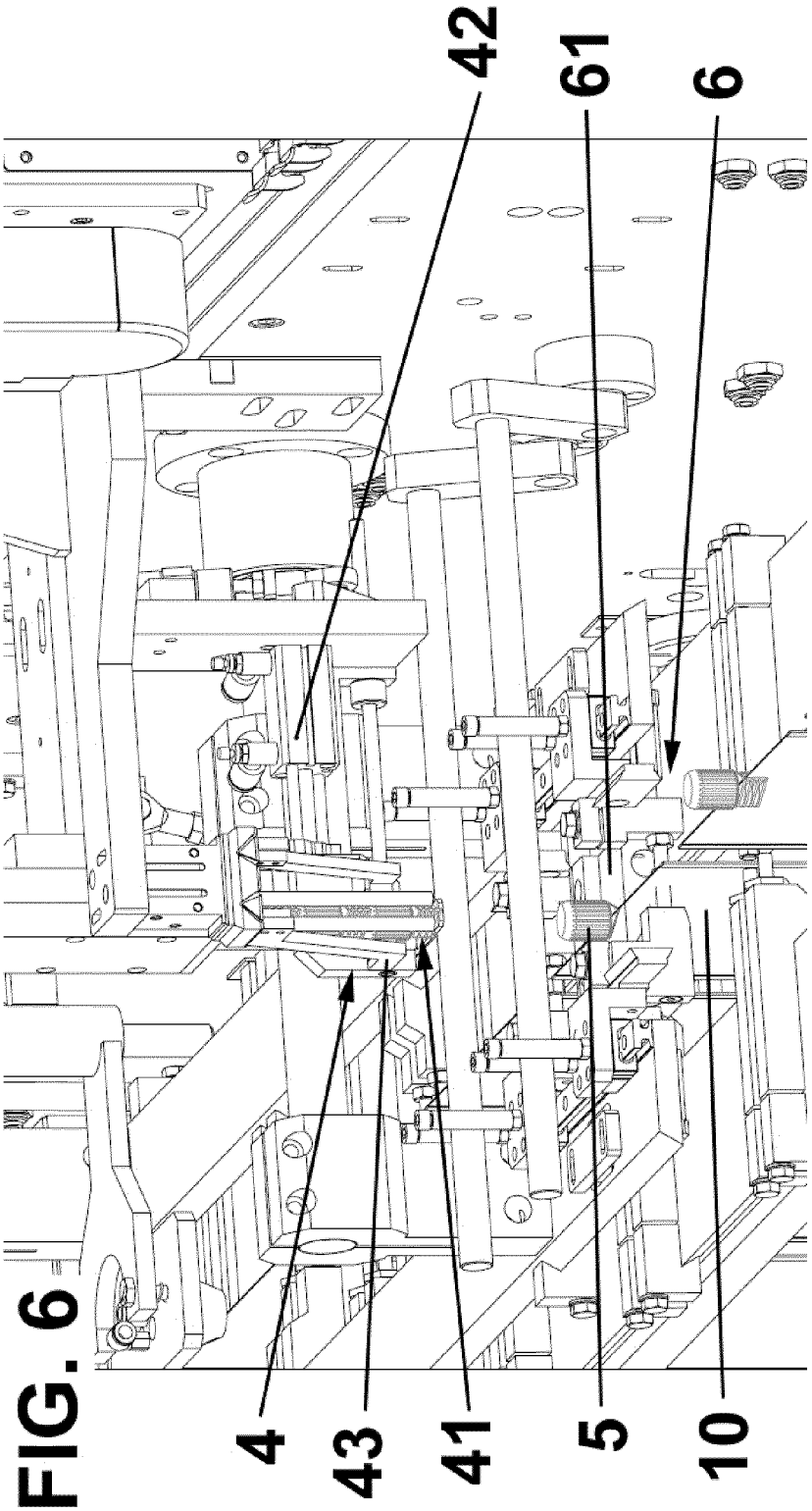
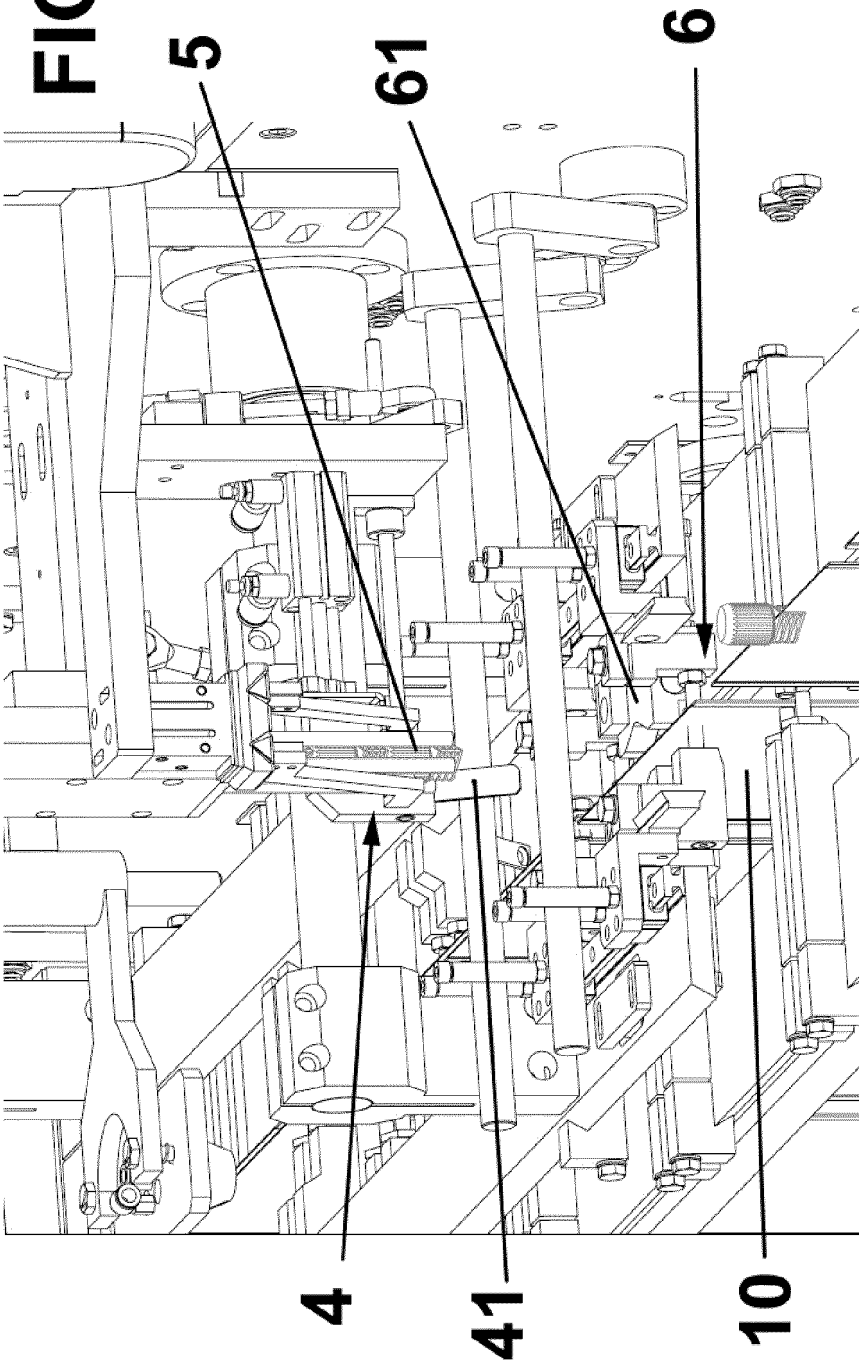


FIG. 6

FIG. 7



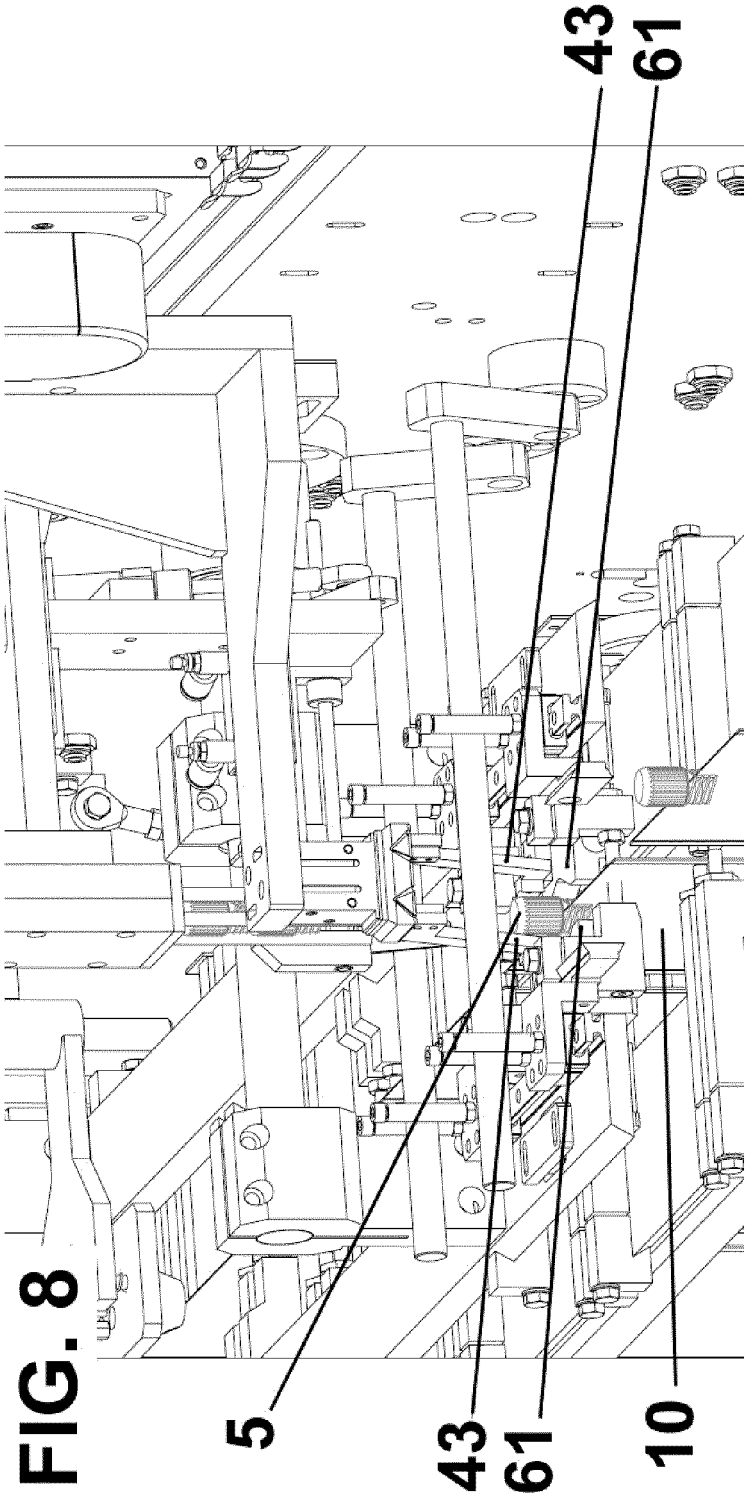


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2019/070337

A. CLASSIFICATION OF SUBJECT MATTER

B65B1/18 (2006.01)
B65B3/17 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	TRACY. *"Horizontal packaging machine premade pouch packer zippered bag fill seal doypack machinery".* 20/06/2015 Retrieved from Internet on 30/01/2020 at the address: https://www.youtube.com/watch?v=aNRIa2TNaj0	1-8, 13,14 9
Y	WO 2014188153 A1 (SAFEFIL) 27/11/2014, Abstract; page 5, lines 19-25; figure 9	9
X Y	SANDY TAICHUAN PACKAGING MACHINERY. *"Doypack pouch with spout filling capping machine, spout doypack packing machine."* 05/03/2018 Retrieved from Internet on 29/01/2020 at the address: https://www.youtube.com/watch?v=2LNvnlQ-Wes	1-8, 13, 14 9

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents , such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
05/02/2020	**(07/02/2020)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer F. Monge Zamorano Telephone No. 91 3495541

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2019/070337

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 0648401 A (TOYO JIDOKI) 22/02/1994, Figure 1; abstract retrieved from DataBase EPODOC with EPOQUE	9
X	CRENTERIAMACHINERY. *"Máquina Envasadora Rotativa de Bolsa Doy Pack con Boquilla."* 15/06/2016 Retrieved from Internet on 28/01/2020 at the address: https://www.youtube.com/watch?v=9MepXmjRtkQ	1-8, 13, 14
X	US 2009098369 A1 (MURRAY) 16/04/2009, Figure 7	1

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2019/070337

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JPH0648401 A	22.02.1994	JP3261543B B2	04.03.2002
US2009095369 A1	16.04.2009	NONE	

Form PCT/ISA/210 (patent family annex) (January 2015)