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(54)

APPARATUS FOR WELDING AND CUTTING A HEAD OF BAGS FOR FOODS

(57)

An apparatus for welding and cutting a head of bags for foods is described. The apparatus comprises:

- a pair of first (412) and second (411) welding elements,
- means (413-416) able to arrange the first and second welding elements in a resting position (A1), in which the first and second welding elements are in opening position, and at a working position (A2), in which the first and second welding elements are in closing position on the flaps (3) of the head of the bag for welding said flaps,
- cutting means (420) able to cut the upper part (401) of the head of the bag in the working position (A2) of the first and second welding elements, said upper part being positioned over the previously welded part of the head of the bag,
- suction means (430) configured to suck said previously cut upper part of the head of the bag,
- clamping means (440) able to grip the previously cut upper part of the head of the bag in the working position of the first and second welding elements and to arrange it over the first welding element (412) in the resting position of said first and second welding elements for the suction operation of the suction means.

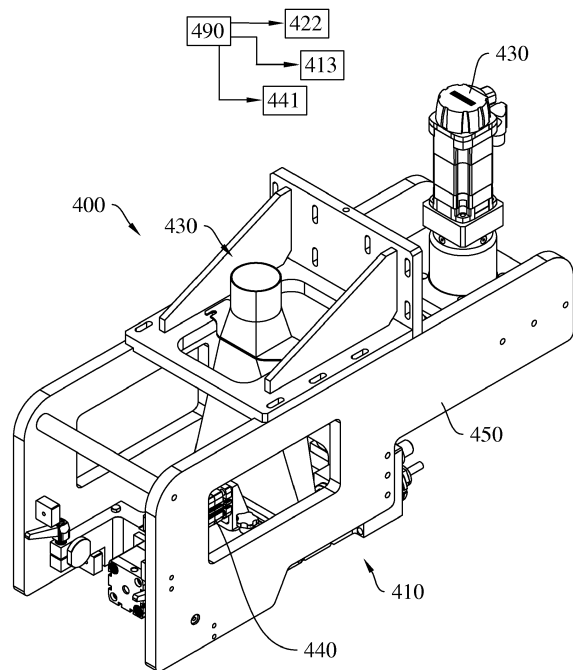


FIG.1

Description

[0001] The present invention relates to an apparatus for welding and cutting the head of bags for foods, preferably for alimentary pasta, granular products and the like, preferably plastic bags.

[0002] Apparatuses for welding the head of bags and for cutting the part of head in excess are known in the prior art; said apparatuses mostly belong to large apparatuses for packaging bags, i.e. of pasta.

[0003] Said apparatuses comprise a welding device of the upper flaps of the head of the bag and means for cutting and removing the upper part from the welded zone of the head of the bag. Generally, said means comprise a suction device arranged over the welding device and able to suck the cut part of the head of the bag.

[0004] However, the arrangement of the suction mouth of the suction device over the welding zone causes a cooling of the welding plates which achieve in this manner an imperfect welding and therefore a poor bag packaging quality.

[0005] EP-A-2657005 describes an apparatus for welding and cutting a bag. Said apparatus comprises compressed air means able to remove the cut part from the head of the bag.

[0006] It is the object of the present invention to provide a welding and cutting apparatus for the head of a bag for alimentary pasta which eliminates the aforesaid drawback and allows a greater quality in bag packaging.

[0007] According to the present invention, said object is achieved by an apparatus for welding and cutting the head of a bag for foods, said apparatus comprising:

- a pair of first and second welding elements,
- means able to arrange said first and second welding elements in a resting position, in which said first and second welding elements are in opening position, and in a working position, in which said first and second welding elements are in closing position on the flaps of the head of the bag for welding said flaps,
- cutting means able to cut the upper part of the head of the bag in the working position of said first and second welding elements, said upper part being positioned over the previously welded part of the head of the bag,
- suction means configured to suck said previously cut upper part of the head of the bag,

characterized in that it comprises clamping means able to grip said previously cut upper part of the head of the bag in the working position of said first and second welding elements and to arrange it over said first welding element in the resting position of said first and second welding elements for the suction operation of said suction means.

[0008] The features and the advantages of the present invention will be apparent from the following detailed description of a practical embodiment thereof, illustrated by

way of non-limiting example in the accompanying drawings, in which:

figure 1 is a perspective view of an apparatus for welding and cutting the head of bags for foods according to the present invention;

figure 2 is a front view of the apparatus of figure 1 in a resting position;

figure 3 is a section view taken along line III-III of the apparatus of figure 2 in a first working position;

figure 4 is a section view taken along line III-III of the apparatus of figure 2 in a second working position;

figure 5 is a section view taken along line III-III of the apparatus of figure 2 in a third working position;

figure 6 is a section view taken along line III-III of the apparatus of figure 2 in a fourth working position;

figure 7 is a section view taken along line III-III of the apparatus of figure 2 in a fifth working position;

figure 8 is a plan view of the apparatus of figure 1;

figure 9 is a perspective view in greater detail of the first welding assembly;

figure 10 is a side view of the assembly of figure 9.

[0009] Figures 1-10 show an apparatus 400 for welding and cutting the head 1 of bags 2 for foods, preferably for alimentary pasta, granular products and the like, in particular plastic bags, according to the present invention.

[0010] The apparatus or assembly 400 comprises a welding device 410 for welding the flaps 3 of the head 1 of the bag 2, a device 420 for cutting the upper part 401 of the head 1 of the bag 2 and a suction device 430 for sucking the upper part 401 already cut, as shown in the figures 1, 2 and 8.

[0011] The device 410 comprises a pair of elements 411, 412 able to close in the working position A2 for welding the head 2 of the bag 1 (figures 3-7); in particular, the device 410 comprises a fixed element 411 and an element 412 actuated by an electric motor 413 by a connecting rod 414 hinged to a pin 415 integral with a plate 416 rotated by the motor 413.

[0012] The apparatus also comprises a further device 440 able to move the previously cut upper part 401 of the head 2 from the welding zone 460 towards the suction zone 431 under the suction mouth 432 of the device 430 (figures 3-7, 9, 10); the device 440 comprises a pair of clamping elements 442, 443 and moving means 441 of the clamping element 442 alone.

[0013] The device 420 comprises a blade 421 able to cut the head 1 of the bag 2 and create the upper part or tongue 401 to be removed (figures 3-7, 9, 10); the blade 421 is moved by the moving means 422.

[0014] The apparatus according to the invention comprises a single frame 450 which carries the devices 410, 420, 430 and 440.

[0015] The electric motor 413, the moving means 441, 422 and the suction device 430 are controlled by a control device 490.

[0016] As shown in greater detail in figures 2, 3, the

device 410 comprises a first structure 417, with which the welding element 411 is integral, and a second structure 418, to which the welding element 412 and the clamping element 443 are fixed; the second structure 418 is totally movable because it is moved by the electric motor 413 by the connecting rod 414, the pin 415 e and the plate 416.

[0017] The second structure 418 may be moved by the electric motor 413 from a resting position A1 (figure 3) to a working position A2 (figure 4) and vice versa; the second structure 418 is sliding on a guide 419 integral with the frame 450.

[0018] The first structure 417 is fixed but some of its elements, the blade 421 and the clamping element 442, are movable with respect to the structure 417 itself, as shown in greater detail in figures 3 and 9, 10. The first structure 417 comprises the moving means 422, 441, preferably pneumatic cylinders of the blade 421 and of the element 442.

[0019] The suction device 430 comprises a suction hood 433 integral with the frame 490; the suction mouth 432 is arranged over the suction zone 431 which is adjacent to the zone in which the welding element 412 is present when the element 412 itself is arranged in the resting position A1.

[0020] The apparatus 100 according to the invention operates in the following manner.

[0021] In the step of resting A1, the bag 2 is conveyed by the conveying means 451 to the position under the device 410 and with the flaps 3 of the head 1 arranged between the welding elements 411, 412 and preferably joined, as shown in figures 3.

[0022] Successively, the control device 490 controls the motor 413 of the device 410 so as to make the rotational plate 416 turn; this allows the displacement of the second structure 417 along the X axis, orthogonal to the flaps 3 of the walls of the head 1 of the bag 2, so as to slide along the guide 419 and allows the closing of the element 412 on the element 411, as shown in figure 4. In such a manner, the welding of the flaps 3 is achieved by the elements 411, 412 which are heated, preferably by electric current.

[0023] Successively, the control device 490 controls the moving means 422 to cut the upper part 401 of the flaps 3 over the part 423 of the flaps 3 previously welded in the working position A3, as shown in figure 5. The moving means 422 allow the displacement of the blade 421 along the X axis to cut the flaps 3 of the head 2.

[0024] Successively, the control device 490 controls the moving means 441 to move the clamping element 442 along the B axis to the working position A4 when the second structure 418 returns to the resting position, as shown in figure 6. The clamping element 442 of the first structure 417 collaborates with a clamping element 443 of the structure 418 so as to grip the tongue 401 and convey it into the suction zone 431 under the suction mouth 432 of the hood 433. At the same time, the control device 490 controls the moving means 422 to take the

blade 421 to its resting position.

[0025] So, the tongue 401 is displaced from the welding zone 460, in which the elements 411 and 412 are closed to weld the flaps 3 of the head 2, to the suction zone 431 which coincides with the zone of the resting position A1 of the welding element 412.

[0026] Successively, the control device 490 controls the activation of the suction device 430 and the moving means 441 to displace the clamping element 442 along the X axis to the resting position, as shown in figure 7, in which the new working position of the apparatus 400 is indicated by position A5. In such a manner, the tongue 401 is sucked by the suction device 430 through the mouth 432 and the hood 433.

[0027] The welding elements 411, 412 are protected by the suction flow coming from the hood 433 by the presence of the clamping elements 442, 443 in the working position A5 of the apparatus 400, i.e. the elements 411, 412 are arranged between the elements 411, 412 and the suction mouth 432 in the suction flow path of the hood 433, preferably a path along the axis Y, preferably a vertical axis.

[0028] Preferably, the suction hood 433 is arranged so that the vertical symmetry axis A of its transverse section coincides with the side profile of the welding element 412.

Claims

1. Apparatus for welding and cutting a head of bags for foods, said apparatus comprising:

- a pair of first (412) and second (411) welding elements,
- means (413-416) able to arrange said first and second welding elements in a resting position (A1), in which said first and second welding elements are in opening position, and at a working position (A2), in which said first and second welding elements are in closing position on the flaps (3) of the head of the bag for welding said flaps,
- cutting means (420) able to cut the upper part (401) of the head of the bag in the working position (A2) of said first and second welding elements, said upper part being positioned over the previously welded part (423) of the head of the bag,
- suction means (430) configured to suck said previously cut upper part of the head of the bag,

characterized in that it comprises clamping means (440) able to grip said previously cut upper part of the head of the bag in the working position of said first and second welding elements and to arrange it over said first welding element (412) in the resting position of said first and second welding elements for the suction operation of said suction means.

2. Apparatus according to claim 1, **characterized in that** a single frame (450) is comprised, able to take said pair of a first (412) and a second (411) welding elements and their displacement means, said cutting means, said suction means and said clamping means. 5
3. Apparatus according to claim 1, **characterized in that** said means (413-416) comprise moving means of the first welding element (412) only towards the second welding element (411) or away from the second welding element, said second welding element being fixed. 10
4. Apparatus according to claim 3, **characterized in that** said clamping means (440) comprise a first clamp element (443) integral with the first welding element (412) and moved by said moving means of the first welding element and a second clamping element (442) associated with the second welding element (411) but movable with respect to it by further moving means. 15 20
5. Apparatus according to claim 2, **characterized in that** said suction means (430) comprise a suction hood (433) in which the suction mouth (432) is arranged over said first welding element (412) when said first welding element is in the resting position. 25
6. Apparatus according to claim 5, **characterized in that** said suction hood (433) is arranged so that the vertical symmetry axis (A) of its transverse section coincides with the side profile of the first welding element (412). 30 35
7. Apparatus according to claim 3, **characterized in that** said moving means of the first welding element (412) comprise an electric motor (413), said electric motor being able to rotate a plate (416), said first welding element (412) being connected to said first plate so that the clockwise and counterclockwise rotation of the plate determines respectively the displacement of the first welding element from the resting position (A1) to the working position (A2) and the displacement of the first welding element from the working position (A2) to the resting position (A1) or vice versa. 40 45

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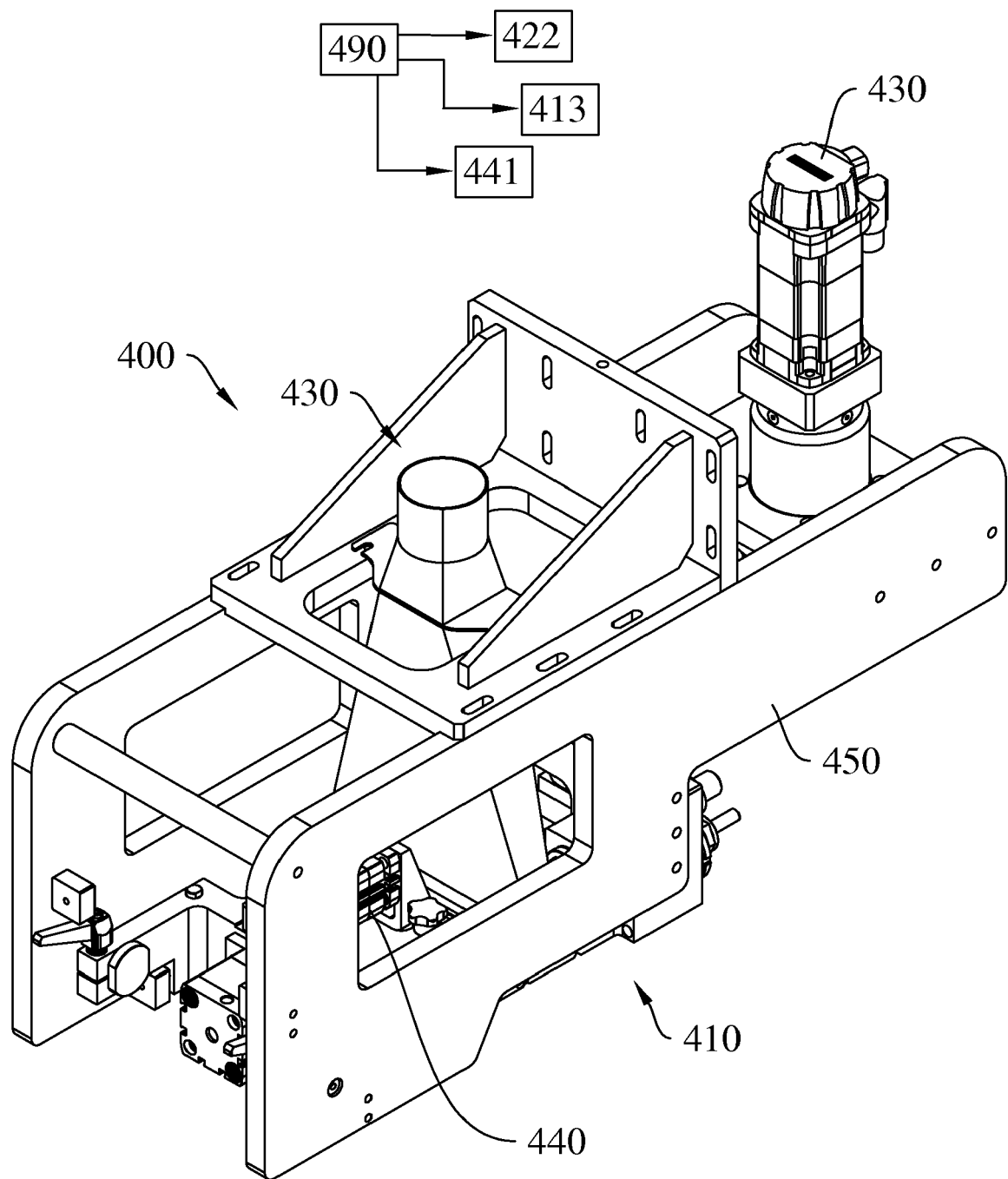
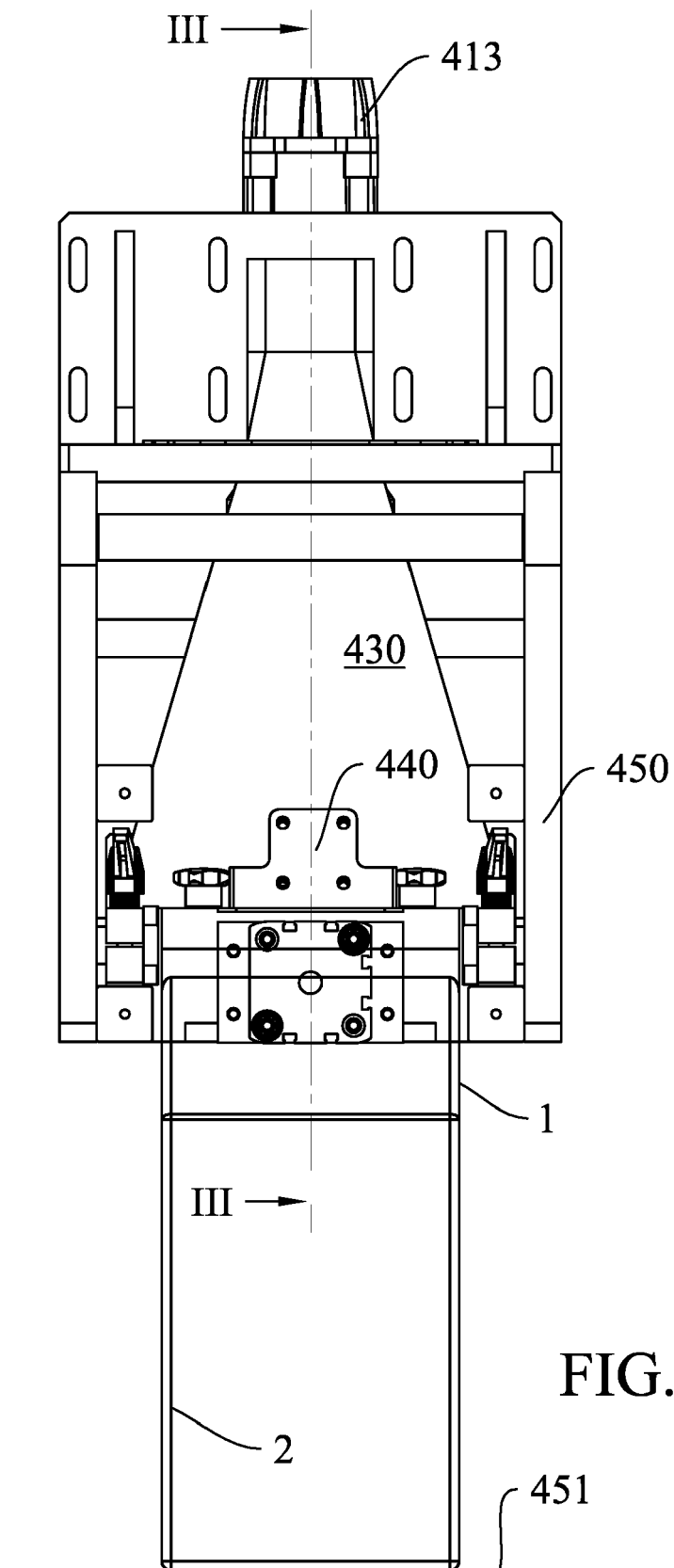


FIG.1



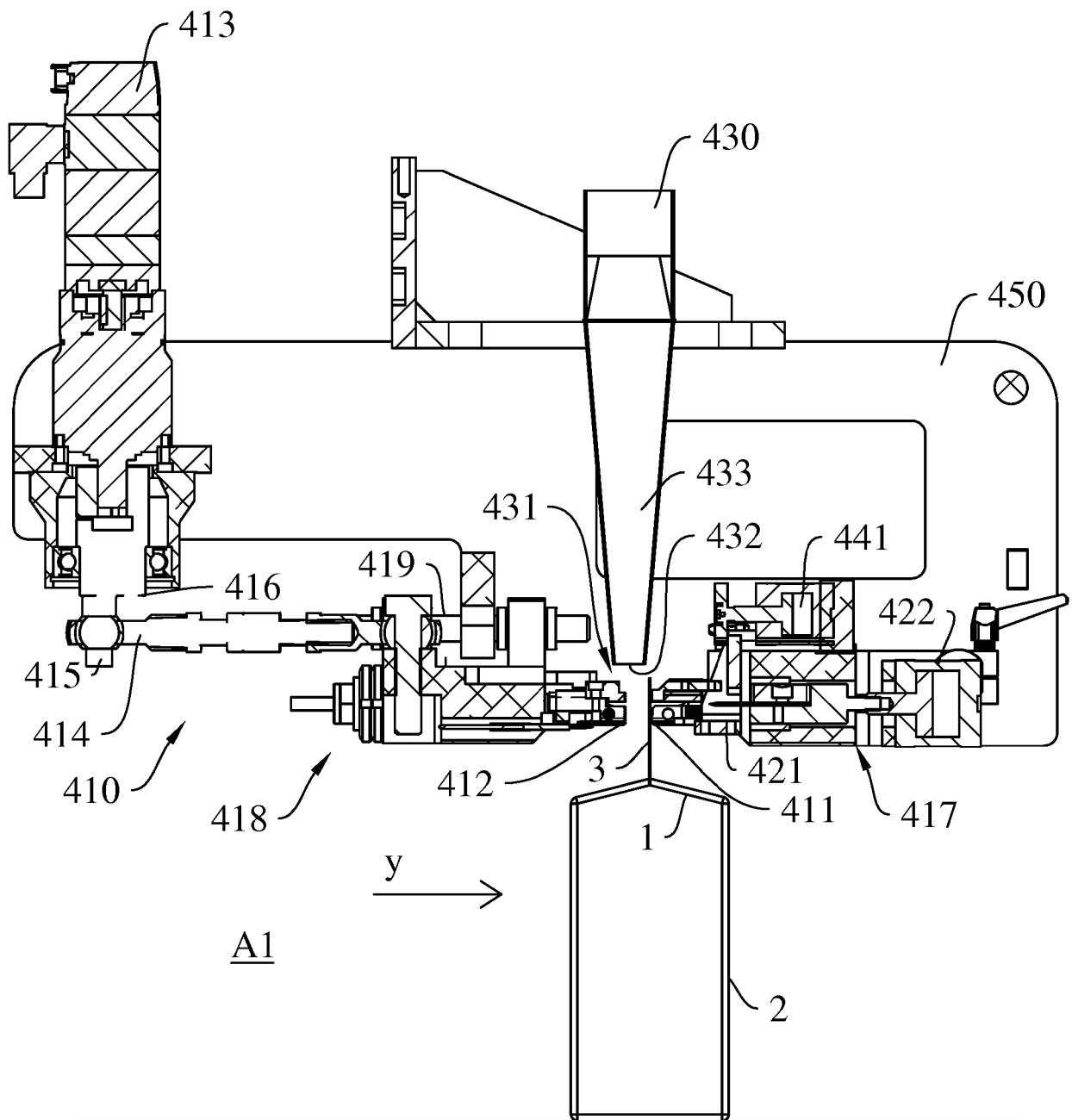


FIG.3

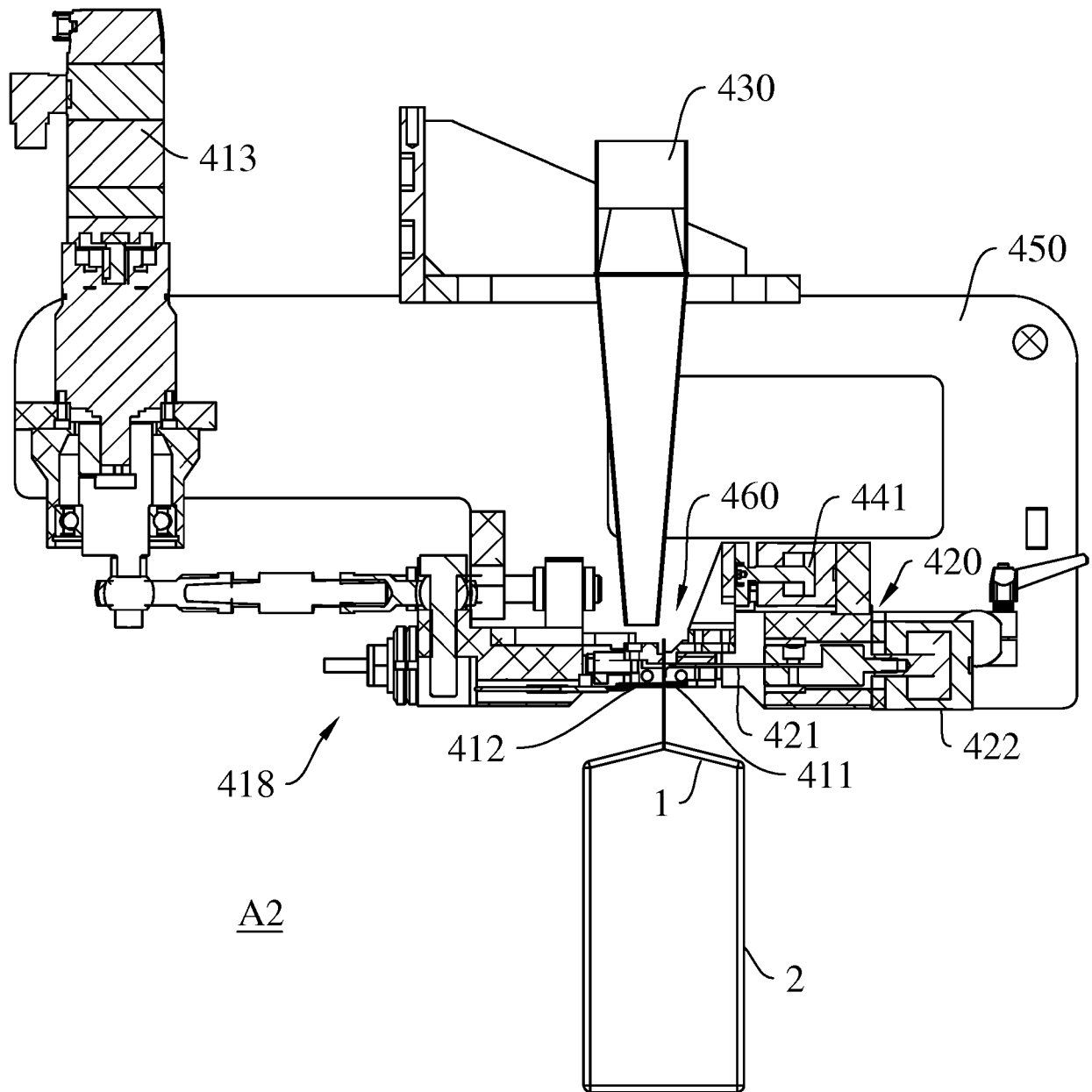


FIG. 4

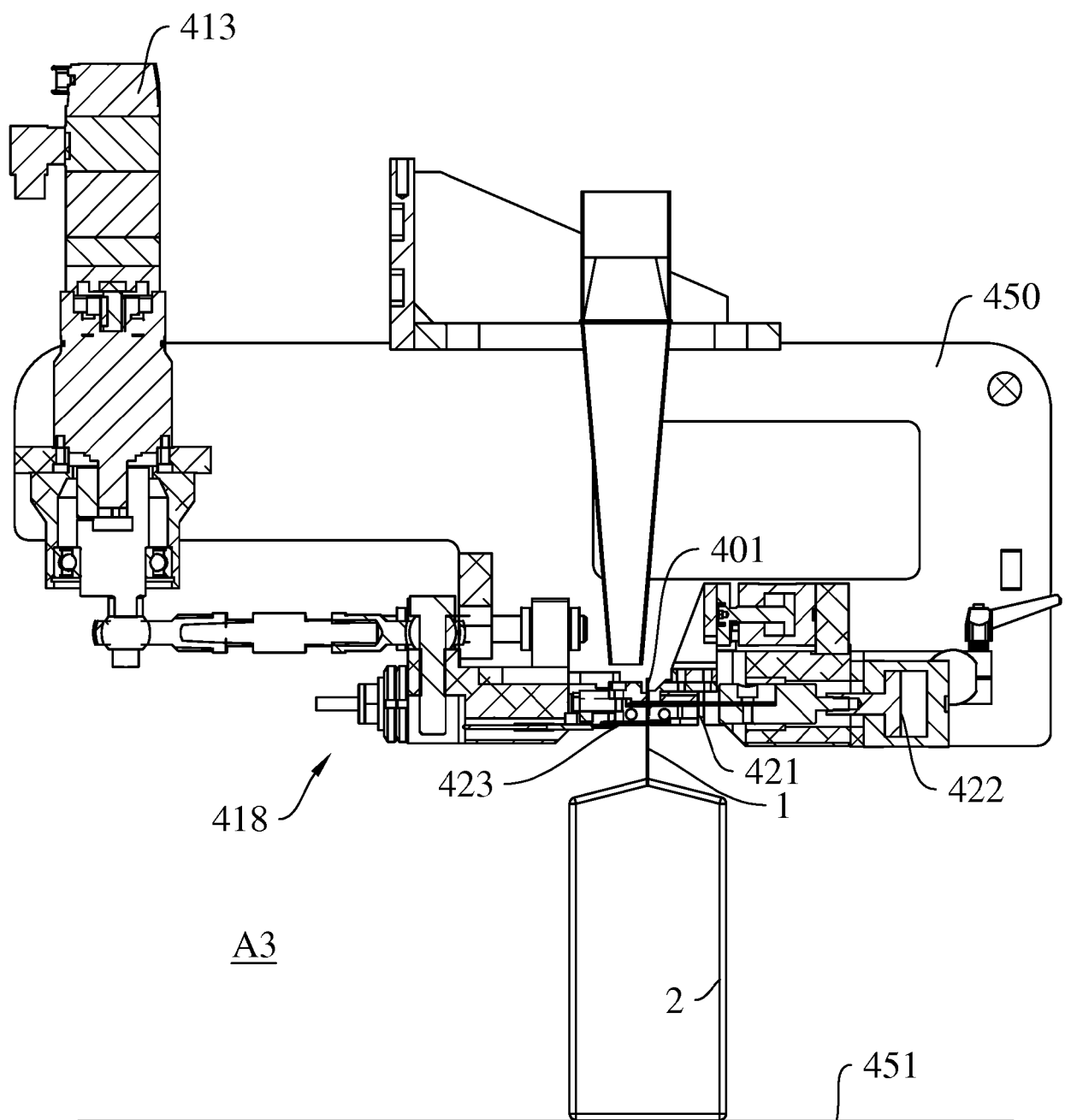


FIG.5

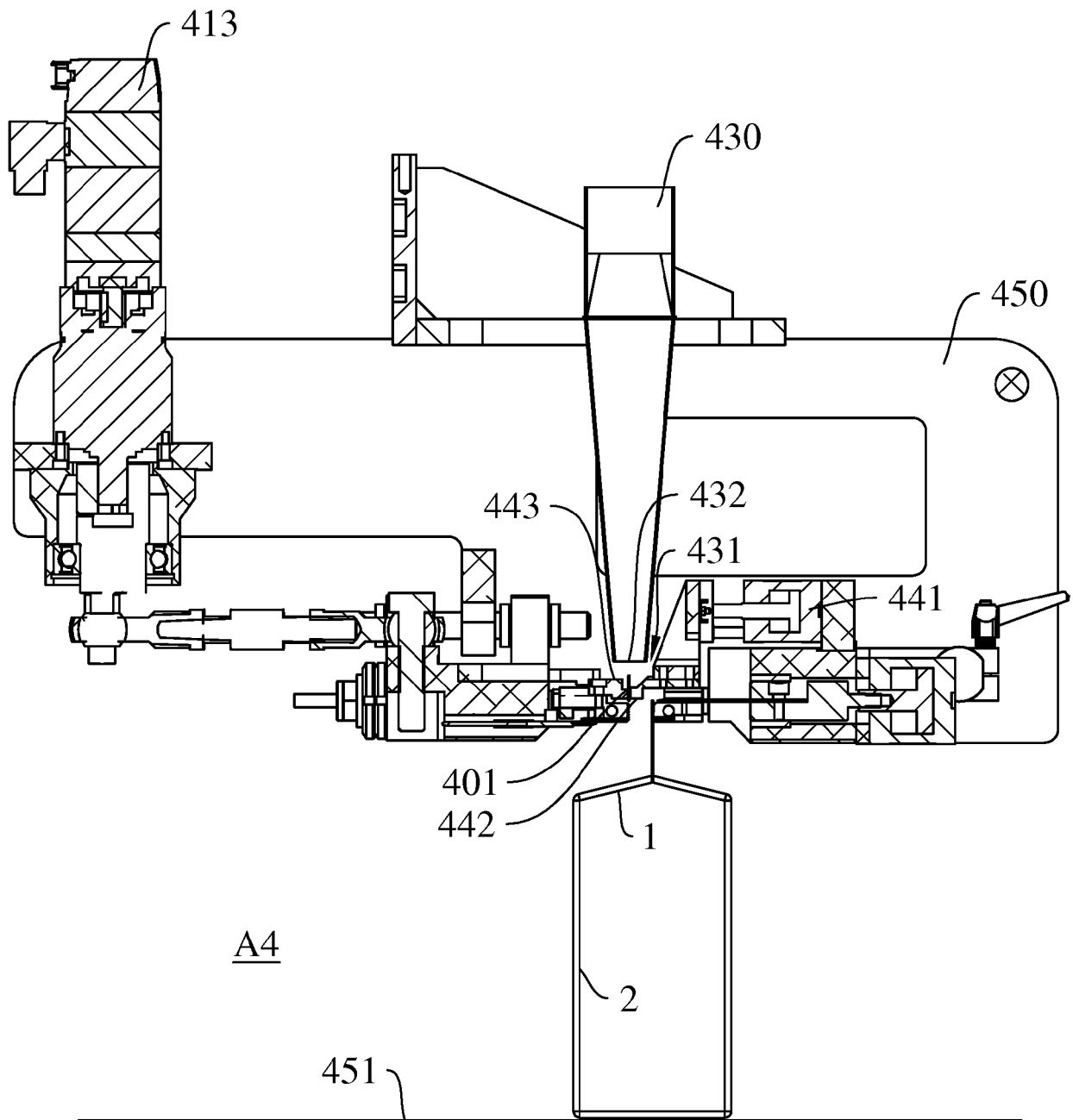


FIG.6

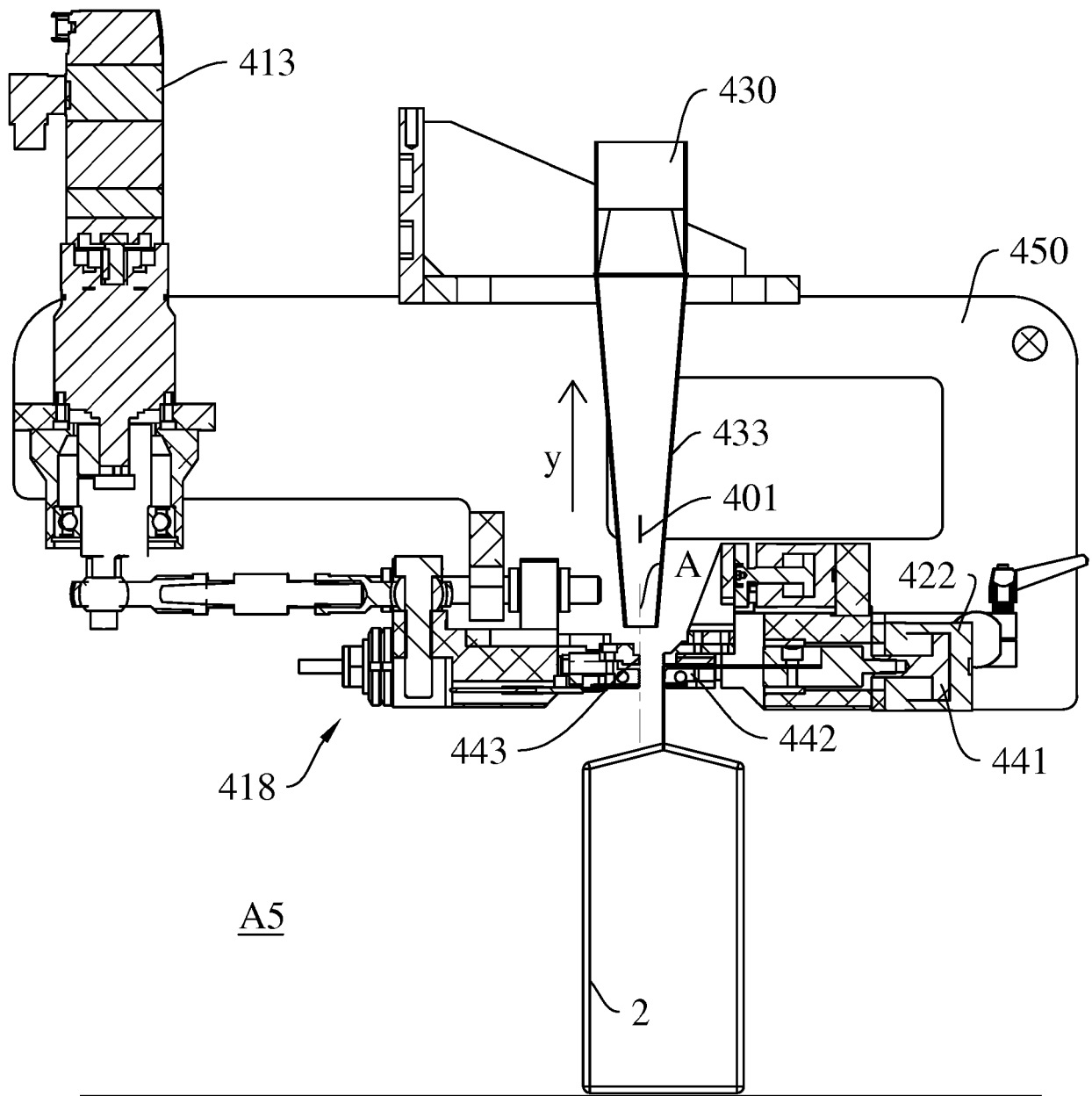


FIG.7

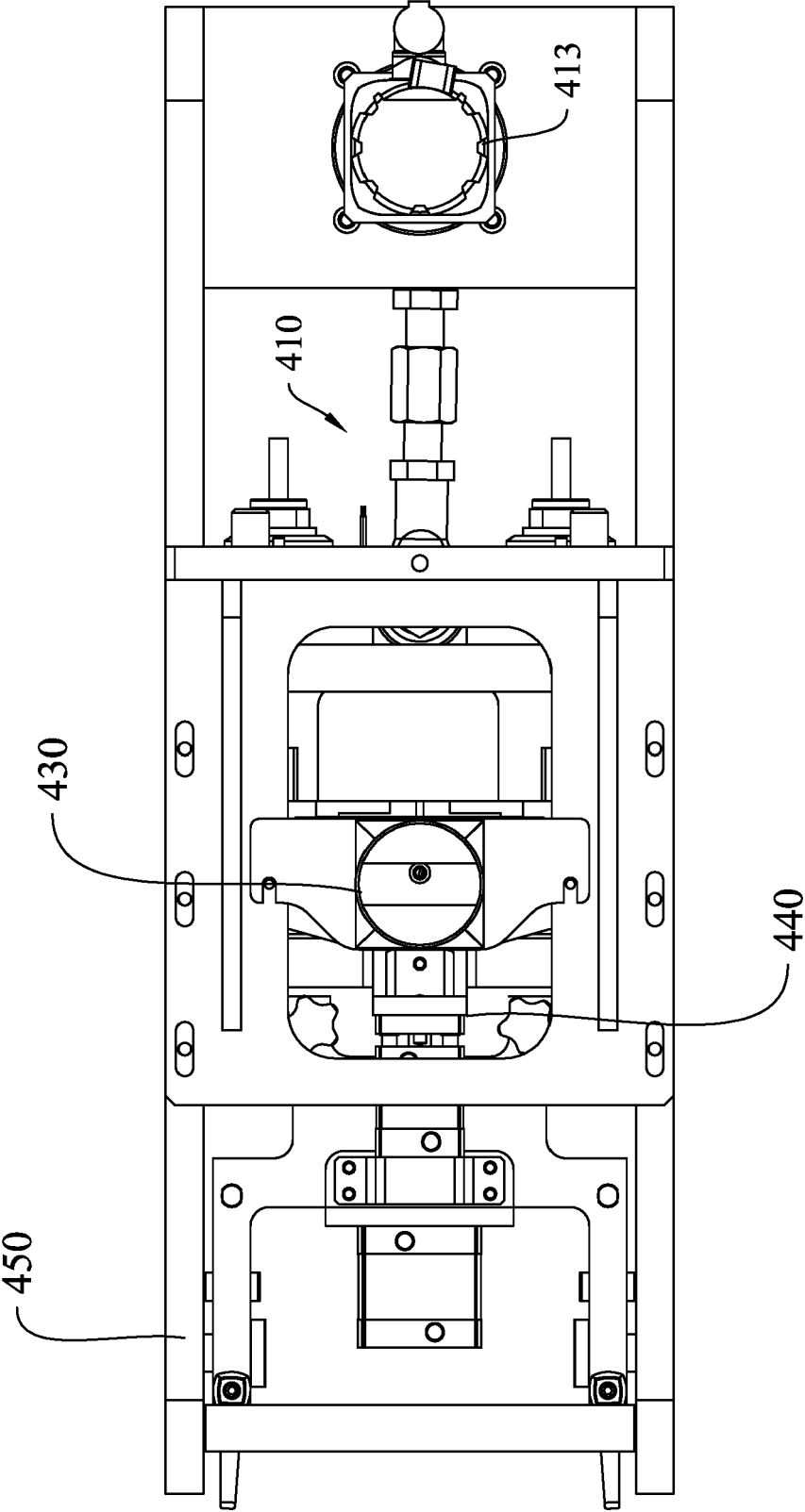


FIG.8

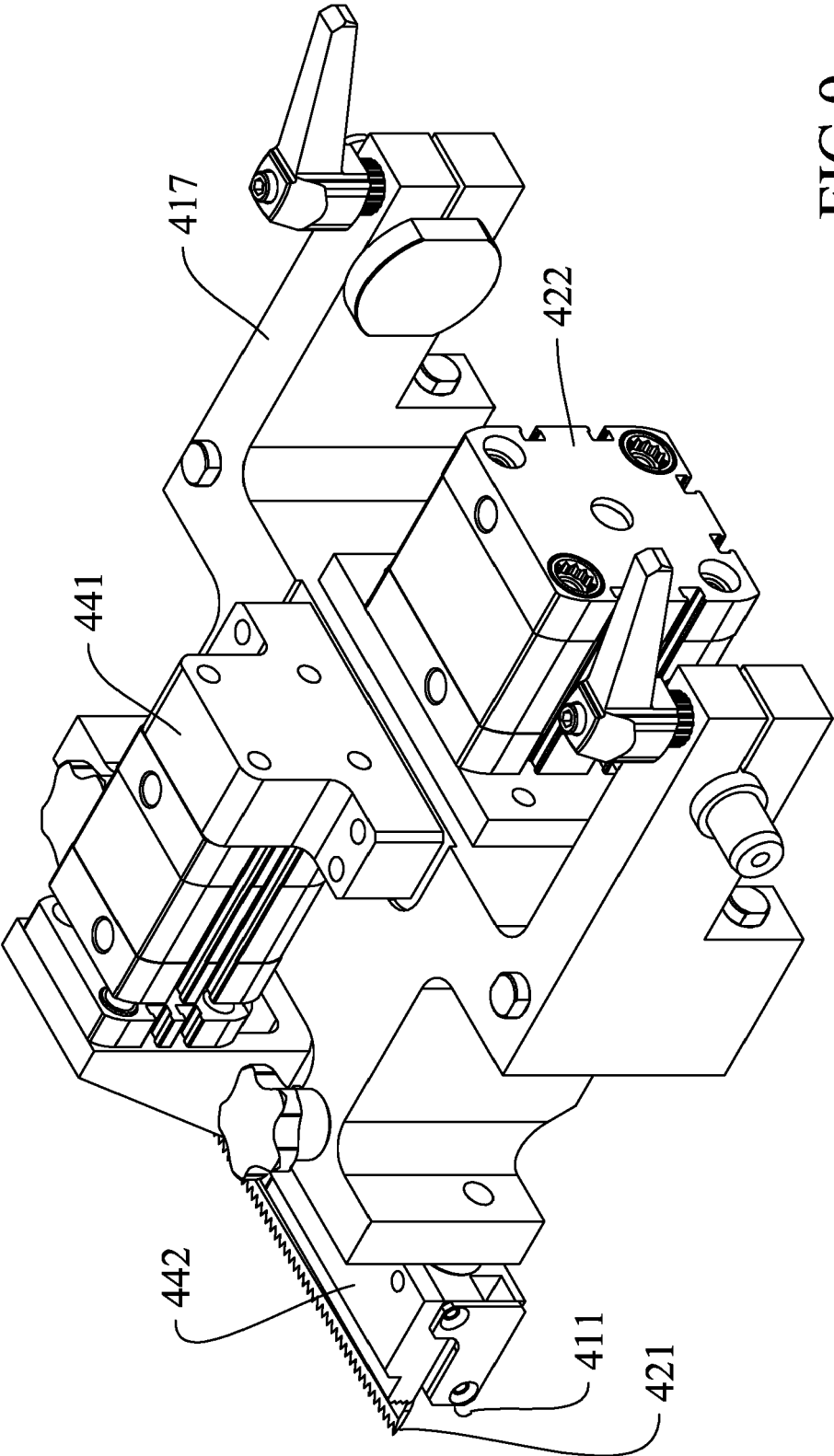


FIG.9

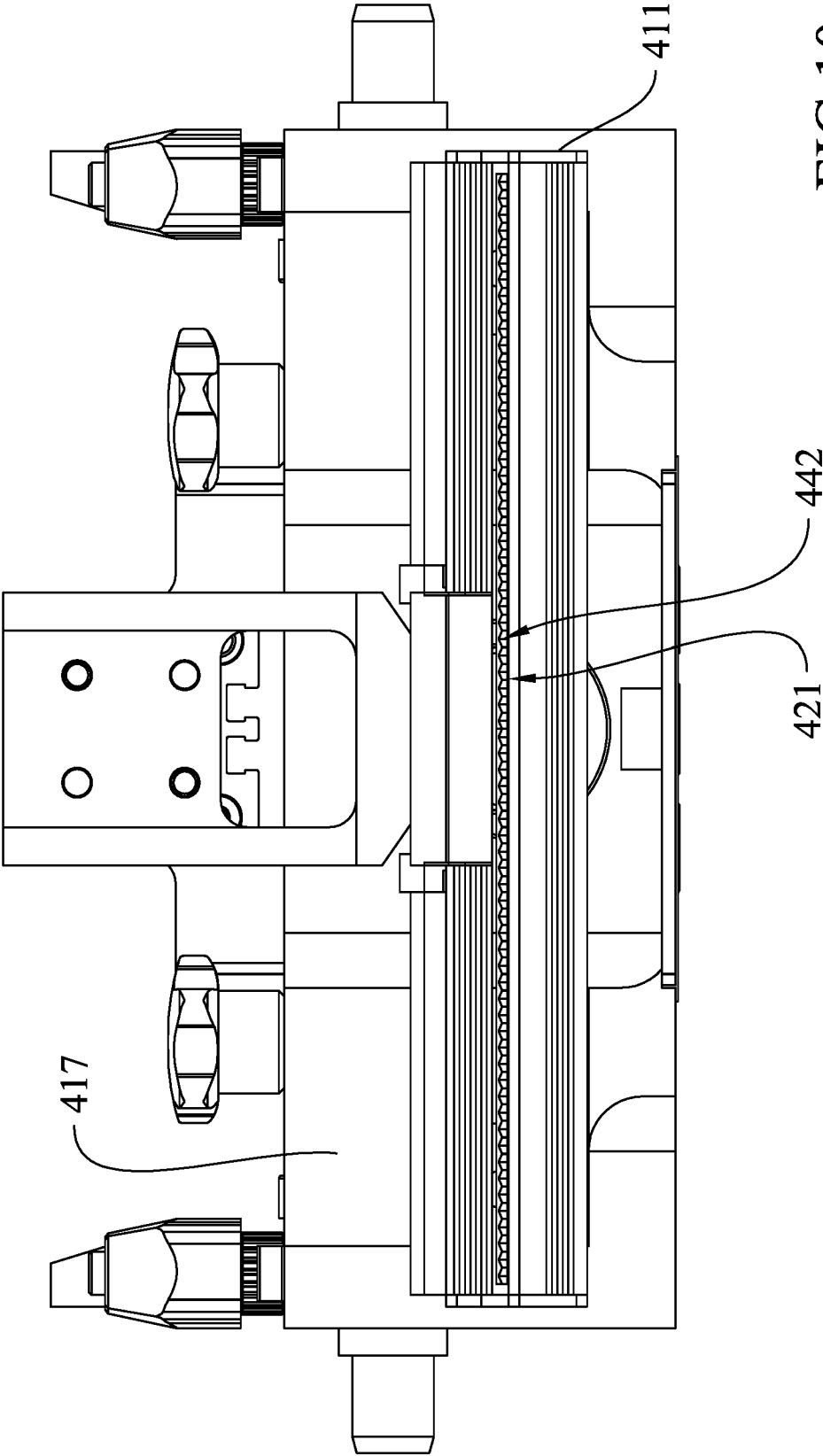


FIG.10



EUROPEAN SEARCH REPORT

Application Number
EP 17 20 8740

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 2 657 005 A1 (MULTIVAC HAGGENMUELLER GMBH [DE]) 30 October 2013 (2013-10-30) * paragraphs [0032] - [0034], [0051] - [0061]; figures 2,5,6,7a-7j *	1-7	INV. B65B61/00 B65B51/14 B65B7/06
A	EP 0 398 306 A1 (MULTIVAC HAGGENMUELLER KG [DE]) 22 November 1990 (1990-11-22) * column 3, line 24 - column 4, line 39; claim 1; figures 1,3 *	1-7	
A	US 2004/139701 A1 (CADY DERRIL R [US] ET AL) 22 July 2004 (2004-07-22) * paragraphs [0046] - [0056]; figures 2a-2c *	1-7	
A	GB 822 335 A (MARIUS BERGHGRACHT) 21 October 1959 (1959-10-21) * page 4, lines 105-125; figure 8 *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 March 2018	Examiner Kulhanek, Peter
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

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

EP 17 20 8740

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2657005 A1	30-10-2013	CN 103373499 A	30-10-2013
		EP 2657005 A1	30-10-2013
		US 2013284214 A1	31-10-2013
EP 0398306 A1	22-11-1990	DE 3916170 A1	22-11-1990
		EP 0398306 A1	22-11-1990
		JP H0398816 A	24-04-1991
		US 5056292 A	15-10-1991
US 2004139701 A1	22-07-2004	AT 514629 T	15-07-2011
		AU 2004206028 A1	05-08-2004
		CA 2528780 A1	05-08-2004
		EP 1611013 A2	04-01-2006
		NZ 541567 A	29-06-2007
		US 2004139701 A1	22-07-2004
		US 2005150195 A1	14-07-2005
		US 2008127614 A1	05-06-2008
		US 2009173436 A1	09-07-2009
		US 2011138747 A1	16-06-2011
		WO 2004065091 A2	05-08-2004
GB 822335 A	21-10-1959	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 2657005 A [0005]