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

(11) **EP 3 417 731 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.12.2018 Bulletin 2018/52

(51) Int Cl.:
A41H 37/00 *(2006.01)* ***A41H 37/10*** *(2006.01)*
A41H 43/02 *(2006.01)*

(21) Application number: **18179033.8**

(22) Date of filing: **21.06.2018**

(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: **21.06.2017 TR 201709257**

(27) Previously filed application:
21.06.2017 TR 201709257

(71) Applicant: **Silverline Endüstri ve Ticaret Anonim Sirketi**
Merzifon/Amasya (TR)

(72) Inventors:
- **Parin, Süleyman**
  Istanbul (TR)
- **Abdalov, Firuz**
  Amasya (TR)
- **Olgun, Mümin**
  Istanbul (TR)
- **Ozaktas, Murat**
  Istanbul (TR)

(74) Representative: **Mutlu, Aydin**
Invokat Intellectual Property Services Ltd.
Kartaltepe Mh. Yildiztepe Sk.
No:6-Bakirköy
34145 Istanbul (TR)

(54) PANEL SETTING MACHINE AND METHOD OF USE

(57) The present invention relates generally to a setting machine (1) which is developed for coupling of planar materials (30) such as carton, cardboard, fabric and the like by riveting of mounting elements (31) thereon. Said setting machine (1) generally comprises a housing body (11), a first chamber (2) for storing of accessory materials, a second chamber (19) for storing pins which are necessary for riveting of the accessory materials, an accessory channel (16) and a pin channel (15) providing feeding of accessories in the first chamber (2) and pins in the second chamber (19) to a point between an upper pressing element (7) and a lower pressing element (8) for riveting, a table assembly (9) upon which the planar material (30) to be riveted with accessories can be moved during the riveting operation, and at least two drive motors which are independent of each other for each of first chamber (2) and second chamber (19).

EP 3 417 731 A1

Description

Technical Field of the Invention

[0001] The present invention relates to a machine which provides the mounting elements to be riveted on a material. More particularly, the present invention relates to a setting machine which is improved for the mounting elements to be riveted onto planar materials such as carton, cardboard, fabric and the like in order to produce boxes and similar products forming a receptacle by way of assembling of said materials.

Background of the Invention

[0002] There are many types of machines used in this area for riveting of mounting and accessory elements such as nails, rivets, or buttons onto fabrics or similar materials. Said machines generally comprise a chamber for storing the accessory elements, a channel for feeding the accessory elements to the place of riveting operation and a motor which drives the said system. More particularly, said machines can be designed to have different equipments depending on the accessory elements or structure of the material to be treated.

[0003] One of the studies carried out in this field is disclosed in document WO 98/02055 A1. The machine disclosed in this document is a machine consisting of upper and lower parts for setting rivets, buttons and the like on a material, and one of these parts performs an evading movement during the riveting process. In order to provide correct and reliable riveting, the evading movement is used to monitor the riveting operation.

[0004] Another machine in this field is disclosed in document WO 98/30832 A1. Said machine is used for attaching buttons and similar materials to a fabric, and comprises a lower tong and a plunger for the riveting operation. At the upper end of the plunger a driving mechanism is provided wherein said mechanism has a finger guarding hoop which stops the drive mechanism when the plunger has an obstruction in the upper plunger's path of movement.

[0005] Another study is disclosed in the utility model document TR 2003/01061. In this document, the accessory riveting machine is directed to riveting of decorative rivets onto the products such as fabric, bag, shoes etc. Said machine comprises a vibrator which provides vibrational motion to the rivets to move in the channel, a riveting piston for receiving and delivering of rivets, a riveting hose, a riveting nozzle, a pressure piston for attaching rivet to fabric, vibrator speed adjustment means, pressure piston speed adjuster and a rivet feeding pedal.

[0006] Although the above machines for riveting are generally suitable for riveting accessories to the textile materials, they do not allow the production of boxes and similar products having the form of a receptacle by combining of planar materials such as a long sized carton, cardboard or fabric sheets. For the automatization of riveting the accessories or coupling parts to the foregoing products, there is currently a need for improved machines suitable to the size of the final product. The present invention provides a setting machine for the solution of these problems in the manner described in the appended claims.

Brief Description of the Invention

[0007] The present invention relates to a setting machine (1) for applying mounting elements (31) on planar materials (30) for the purpose of coupling a plenty of said materials. Said machine generally comprises a housing body (11), a first chamber (2) for storing of accessory materials, a second chamber (19) for storing pins which are necessary for riveting of accessory materials, an accessory channel (16) and a pin channel (15) feeding of the accessories in first chamber (2) and pins in second chamber (19) to a point between upper plunger part (7) and lower plunger part (8) for riveting, a table assembly (9) on which the accessory to be riveted to the planar material (30) can be moved during the riveting operation, and at least two drive motors which are independent of each other for each of the first chamber (2) and second chamber (19). Said pins may be fixing elements such as nails or rivets.

[0008] The setting machine (1) of the invention comprises a table assembly (9) which is divided in two due to the long distance of the planar materials (30). This table assembly (9) is arranged to be located on both sides of the housing body (11) and divided into two parts.

[0009] The setting machine (1) of the invention may comprise sizing plates (14) on the table assembly (9) for moving mounting elements (31) to be riveted to the planar material (30) in the course of the riveting operation. Said sizing plates (14) preferably comprise fixed parts (17) and movable parts (18) which can move in horizontal axis (x).

[0010] The setting machine (1) of the invention may further comprise a hand safety section (5), which can comprise a clamping part for compressing the material during the riveting operation. Said clamping part of the hand safety section (5) can comprise a moving mechanism which is movable in the vertical axis (y) depending on the thickness of the material to be riveted.

[0011] The setting machine (1) of the present invention may further comprise a PLC control mechanism and a display (12) as well as a laser which determines the point at which the pin is pushed onto the planar material (30).

[0012] In a further aspect, the present invention pertains to a method for riveting of the mounting members (31) on said materials to couple a plurality of planar materials (30), comprising the steps of:

- providing a setting machine (1) as described above,
- feeding of said planar material (30) to said machine, and
- riveting of the mounting elements (31) for coupling

of the planar materials (30) in order to provide the final product.

[0013] In preferred embodiments of the invention, said planar material (30) may be carton or cardboard. The final product is preferably a box (301).

Brief Description of the Figures

[0014]

Figure 1 is a representative view of the setting machine of the invention comprising the table assembly on which the material to be treated is placed and set.

Figure 2 is a representative view of the second chamber of the setting machine according to the present invention comprising fixing means.

Figure 3 is a representative view of the body section of the setting machine according to the present invention.

Figure 4 is a representative view of the fixing means mechanism of the setting machine according to the present invention.

Figure 5 is a representative view of the hand safety section of the setting machine according to the present invention.

Figure 6 is a representative view of the accessory mechanism of the setting machine according to the present invention.

Figure 7 is a representative view of the upper pressing element of the setting machine according to the present invention.

Figure 8 is a representative view of the lower pressing element of the setting machine according to the present invention.

Figure 9 is a representative view of the table assembly on which the material to be treated is placed and set in the setting machine of the invention.

Figure 10 is a representative view of the first chamber of the setting machine according to the present invention.

Figure 11 is a representative view of the housing body of the setting machine according to the present invention.

Figure 12 is a representative view of the PLC display of the setting machine according to the present invention.

Figure 13 is a representative view of accessory jaw of the setting machine according to the present invention.

Figure 14 is a representative view of the sizing plates of the setting machine according to the present invention.

Figure 15 is an opened view of the parts of a box before the riveting operation which can be produced by the setting machine according to the present invention.

Figure 16 is an opened view of the parts of a box after the riveting operation which can be produced by the setting machine according to the present invention.

Figure 17 shows a representative view of the complete form of a box upon completion of the riveting operation as produced by the setting machine according to the present invention.

References

[0015]

1. Setting machine
2. First chamber
3. Body section
4. Pin mechanism
5. Hand safety section
6. Accessory mechanism
7. Upper pressing element
8. Lower pressing element
9. Table assembly
10. First chamber mechanism
11. Housing body
12. Display
13. Accessory jaw
14. Sizing plates
15. Pin channel
16. Accessory channel
17. Fixed part
18. Moving part
19. Second chamber
30. Planar material
31. Mounting element
301. Box

Detailed Description of the Invention

[0016] The present invention relates to a setting machine (1) which is developed for riveting of the mounting elements (31) onto planar materials (30) for coupling of said materials (30) in the form as shown in Figures 15 and 16, and for bringing the same into the form of a box (301) as shown in Figure 17.

[0017] Said material in the form of planar plate (30) in the context of the present invention refers to any material intended to have a planar character, such as carton, paper, cardboard, plastic, fabric and denim. Said box (301) in the context of the present invention refers to any three-dimensional object which is obtained as a result of said planar plate materials (30) being attached one to another and having a form of a container with an internal volume. Said mounting elements (31) in the context of the present invention refer to a pin element such as nail or rivet and a corresponding accessory element upon which said pin element is riveted.

[0018] The setting machine (1) of the present invention comprises a table assembly (9) in planar form for placing the planar material (30) to be treated as shown in Fig. 1. Referring to Fig. 11, a housing body (11) carrying the machine elements and the electric power unit of the setting machine (1) is placed onto the table assembly (9), preferably in a middle part thereof. In this way, easy movement of the planar material (30) on the table assembly (9) is ensured. As shown in Figures 1 and 14, sizing plates (14) for adjusting dimensions of the material to be riveted are placed on both sides of the parts of housing body (11) of the table assembly (9) in the setting machine (1) according to the present invention. Said sizing plates (14) comprise a T-shaped structure consisting of a fixed part (17) and a moving part (18) on the table assembly (9) extending on both sides of the housing body (11). Moving part (18) is capable of moving in the horizontal axis (x) on the table assembly (9) by sliding on the fixed part (17). With the sizing plates (14) mentioned above, there is provided adjustment of the dimensions of the planar material, so that a standard riveting operation is carried out on these materials.

[0019] The setting machine (1) comprises a first chamber (2) as shown in Figure 2 for storing accessory materials which are a part of the mounting elements (31) to be riveted onto the planar material (30) on a face of a housing body (11) carrying the machine equipments. The accessory materials stored in said first chamber (2) are fed to an accessory jaw (13) (Figure 13), whereby the riveting operation is carried out, from the first chamber (2) by means of an accessory channel (16). This feeding operation is provided by actuating the first chamber mechanism (10) (Figure 10) by means of a separate motor. As a result of actuating the cylinder located on said first chamber mechanism (10) by means of a motor, accessory materials flow through the accessory channel (16) to the accessory mechanism (6) (Figure 6).

[0020] The setting machine (1) according to present invention further comprises a second chamber (19) accommodating pin elements to be used on the other face of the housing body (11) for riveting the accessory materials on the planar materials. As shown in Fig. 4, the pin elements stored in the second chamber (19) are fed to the pin mechanism (4) by means of a pin channel (15). The pin mechanism (4) of the setting machine (1) of the present invention is driven by the pneumatic cylinders and carries the nails or similar fixing means by a pusher latch, receiving latches, holding latches and the springs located in the lower part of the pin mechanism in order to bring them in alignment with the accessory in the same centre during the accessory riveting operation. In the said carrying operation, the pushing latch carries the fixing means to the next station in each movement, and upon moving backwards, retracted to the starting position in order to receive the subsequent fixing means with the help of the receiving latch by passing underneath the fixing means in the stations, and carries the same up to the body section (3) (Figure 3) whereby the riveting is carried out. According to a preferred embodiment of the invention, the pushing tongue which descends to the pin mechanism (4) can reach to the area of pin riveting in eight round trip movements, and also pins can be placed in eight stations.

[0021] Setting machine (1) of the invention particularly comprises different drive elements for the accessory mechanism (6) and the pin mechanism (4). All mechanisms are driven by different motors rather than a single motor. In this way it becomes possible for each mechanism to be independently operated and controlled. According to a preferred embodiment of the invention, the setting machine (1) comprises five drive elements (e.g. pneumatic cylinders) in total.

[0022] According to a preferred embodiment of the invention, the setting machine (1) of the invention also comprises a display (12) which is preferably a touch screen (12) (Figure 12) connected to a PLC control mechanism. The movement, positions and timings of the mechanisms of the setting machine (1) as detected by the sensors can be changed by means of PLC control mechanism via the display (12). Said display (12) is capable of moving in vertical (y) and horizontal (x) directions with respect to the operator's position by means of a lever on housing body (11). At the same time, the number of accessory or pins to be riveted to the planar material (30) can be counted by means of the PLC control mechanism and these numbers and the movement of mechanisms can be controlled by means of said display (touch screen) (12). In this way, the time loss is prevented and the risks such as wrong counting are eliminated.

[0023] In another aspect, the setting machine (1) of the invention comprises a hand safety section (5) on the body section (3) as shown in Figures 1 and 5. By virtue of the hand safety section (5), operator's fingers are protected from being jammed between the upper pressing element (7) and the lower pressing element (8) during the riveting operation. Referring to Figure 5, hand safety section (5) of the setting machine (1) according to the present invention performs also the compression of the planar material (30) during the riveting operation. With the clamping piece on the hand safety section (5), the material to be treated is compressed and thereafter the accessory riveting operation is performed. Said hand safety section (5) is capable of moving in the vertical axis (y), thus it can be adjusted depending on the thickness of the ma-

terial to be treated. As shown in Figures 7 and 8, accessory riveting operation is carried out by bringing the accessory part coming from the first chamber (2) and the pin elements coming from the second chamber (19) in alignment at a point determined by a laser (not shown) between the upper pressing element (7) and the lower pressing element (8). The determination of the riveting point by means of a laser makes it easier to bring the accessories and the pin in alignment at the same centre and therefore the loss of the accessory or the pin elements is substantially reduced.

Claims

1. A setting machine (1) for coupling of a plurality of planar materials (30) by applying mounting elements (31) thereon, comprising a housing body (11), a first chamber (2) for storing of accessory materials, a second chamber (19) for storing of pins which are necessary for the riveting of said accessory materials, an accessory channel (16) and a pin channel (15) for feeding of the accessories in the first chamber (2) and the pins in the second chamber (19) to a point between an upper pressing element (7) and a lower pressing element (8) for riveting, a table assembly (9) upon which the planar material (30) to be riveted with accessories can be moved during the riveting operation, and at least two drive motors which are independent of each other for each of the first chamber (2) and second chamber (19).

2. A setting machine (1) according to claim 1 wherein said setting machine comprises a table assembly (9) which is arranged to be positioned on both sides of the housing body (11) as divided into two parts.

3. A setting machine (1) according to claim 1 wherein the table assembly (9) comprises sizing plates (14) for moving of the planar material (30) to be riveted with the mounting elements (31) in the course of the riveting operation.

4. A setting machine (1) according to claim 3 wherein said sizing plates (14) comprise fixed parts (17) and moving parts (18) which can move in the horizontal axis (x).

5. A setting machine (1) according to claim 1 wherein said machine comprises a hand safety section (5), which comprises a clamping part for compressing the material to be riveted during the riveting operation.

6. A setting machine (1) according to claim 5 wherein said clamping part of the hand safety section (5) comprises a mechanism which can move in the vertical axis (y) depending on the thickness of the material to be riveted.

7. A setting machine (1) according to claim 1, wherein said setting machine (1) comprises a PLC control mechanism and a display (12).

8. A setting machine (1) according to claim 1 wherein said setting machine (1) comprises a laser which determines the point at which the accessory and the pin are riveted on the planar material (30).

9. A setting machine (1) according to claim 1 wherein said pins are nails or rivets.

10. A method for coupling of a plurality of planar materials (30) by riveting mounting elements (31) thereon, comprising the steps of:

    - providing a setting machine according to claim 1,
    - feeding of the planar material (30) to said machine, and
    - riveting of the mounting elements (31) for coupling of the planar materials (30) in order to provide a final product.

11. A method according to claim 10, wherein said planar materials (30) comprise carton or cardboard.

12. A method according to claim 10, wherein said product is a box (301).

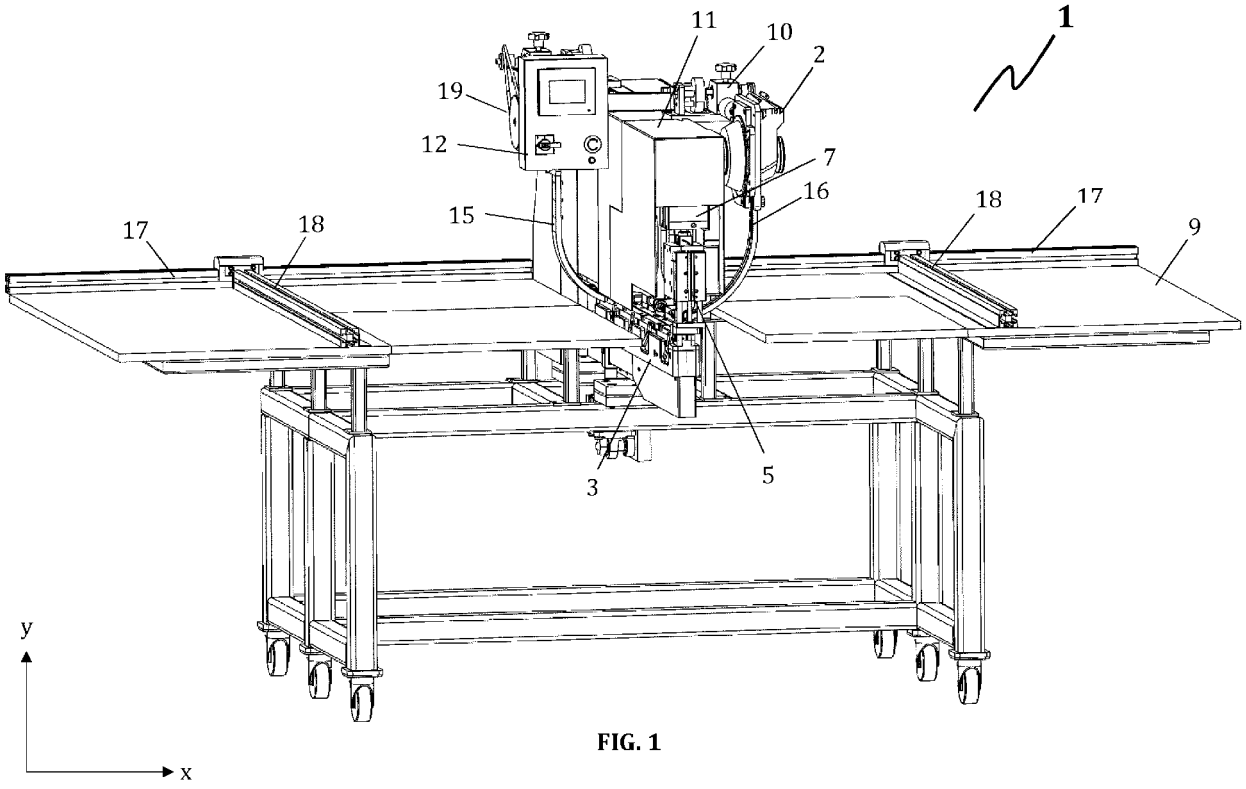

FIG. 1

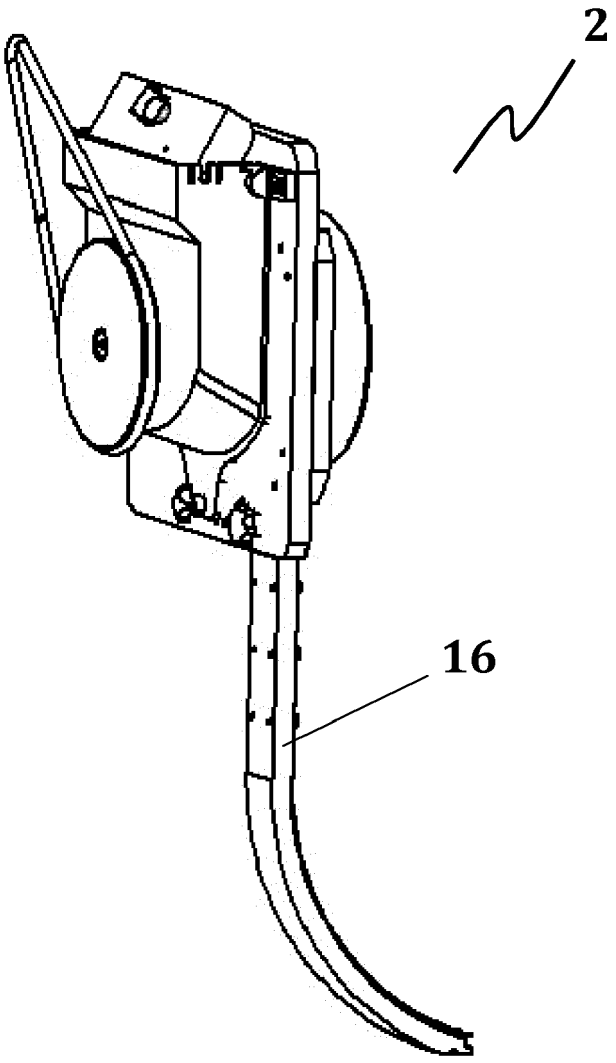

FIG. 2

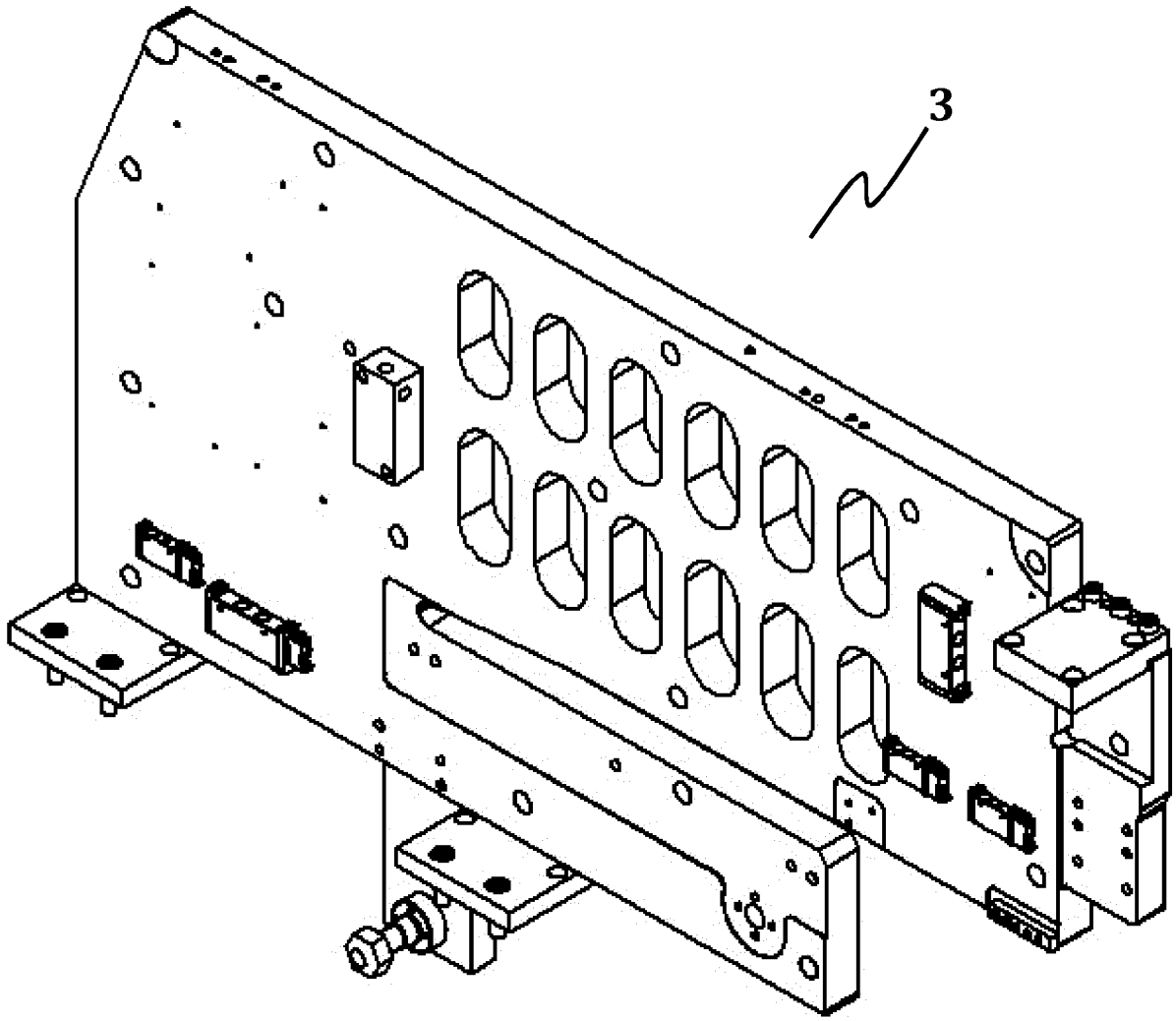

FIG. 3

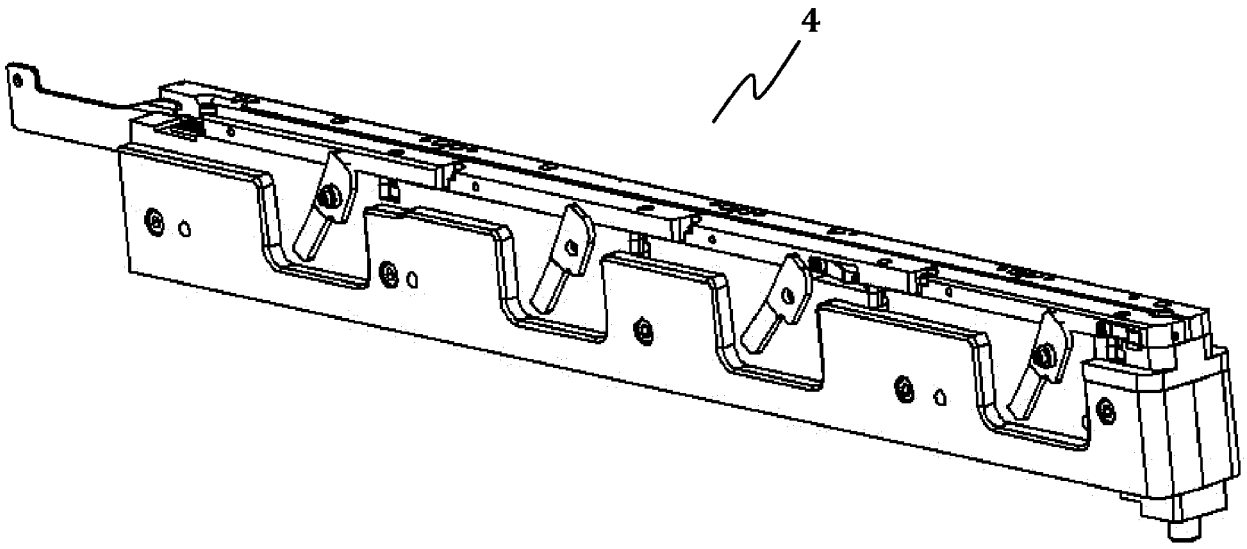

FIG. 4

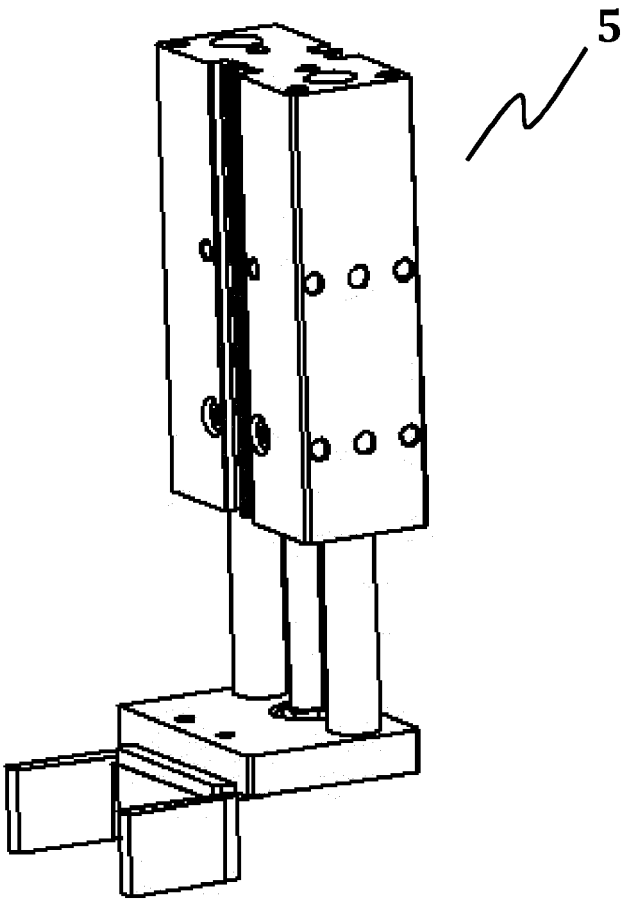

FIG. 5

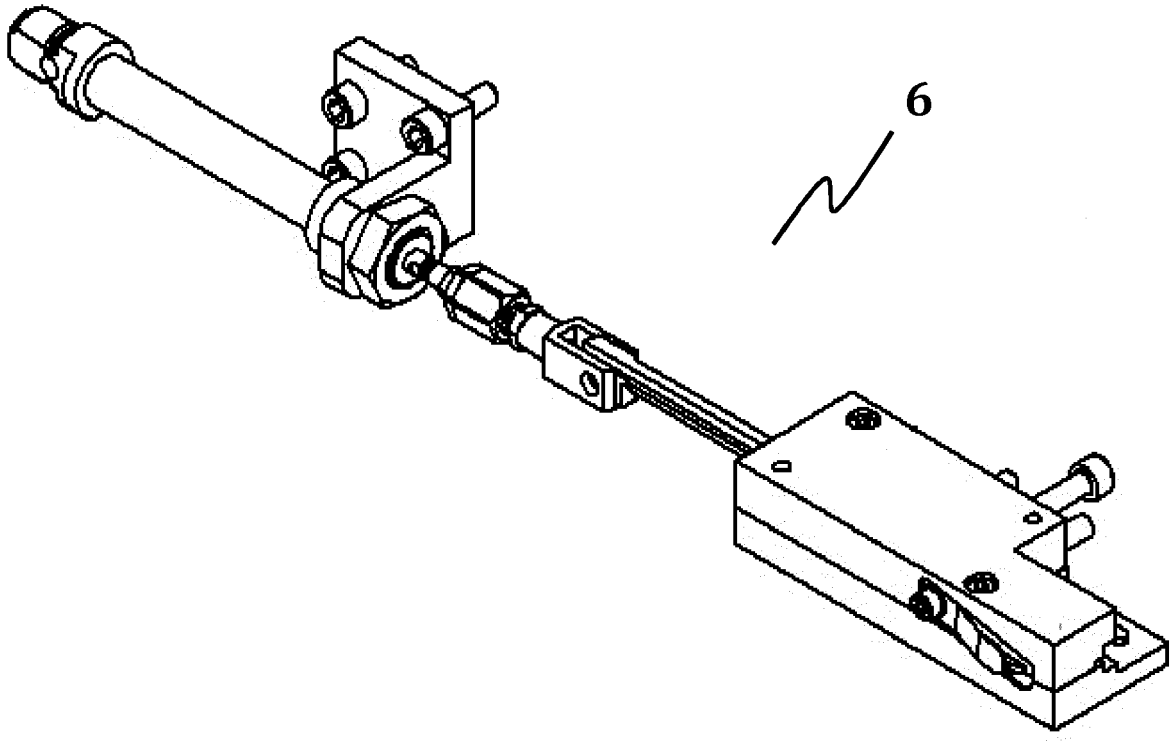

FIG. 6

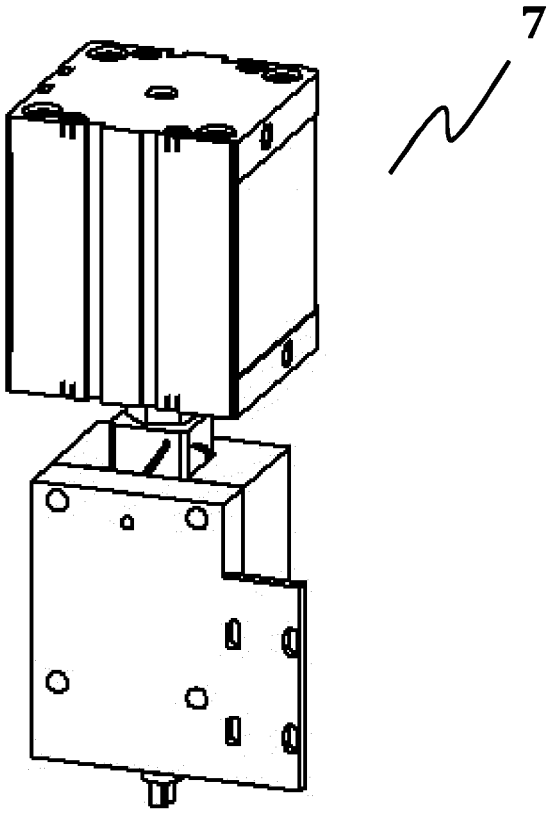

FIG. 7

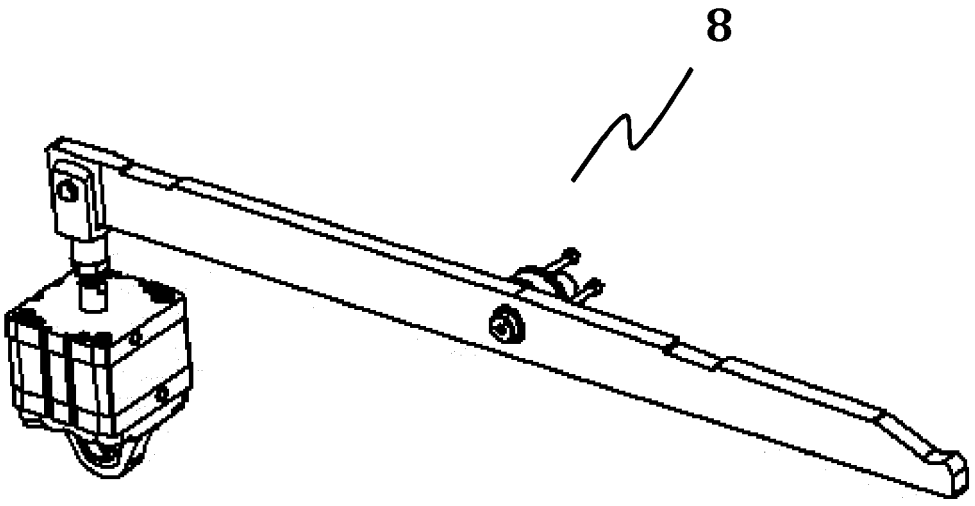

FIG. 8

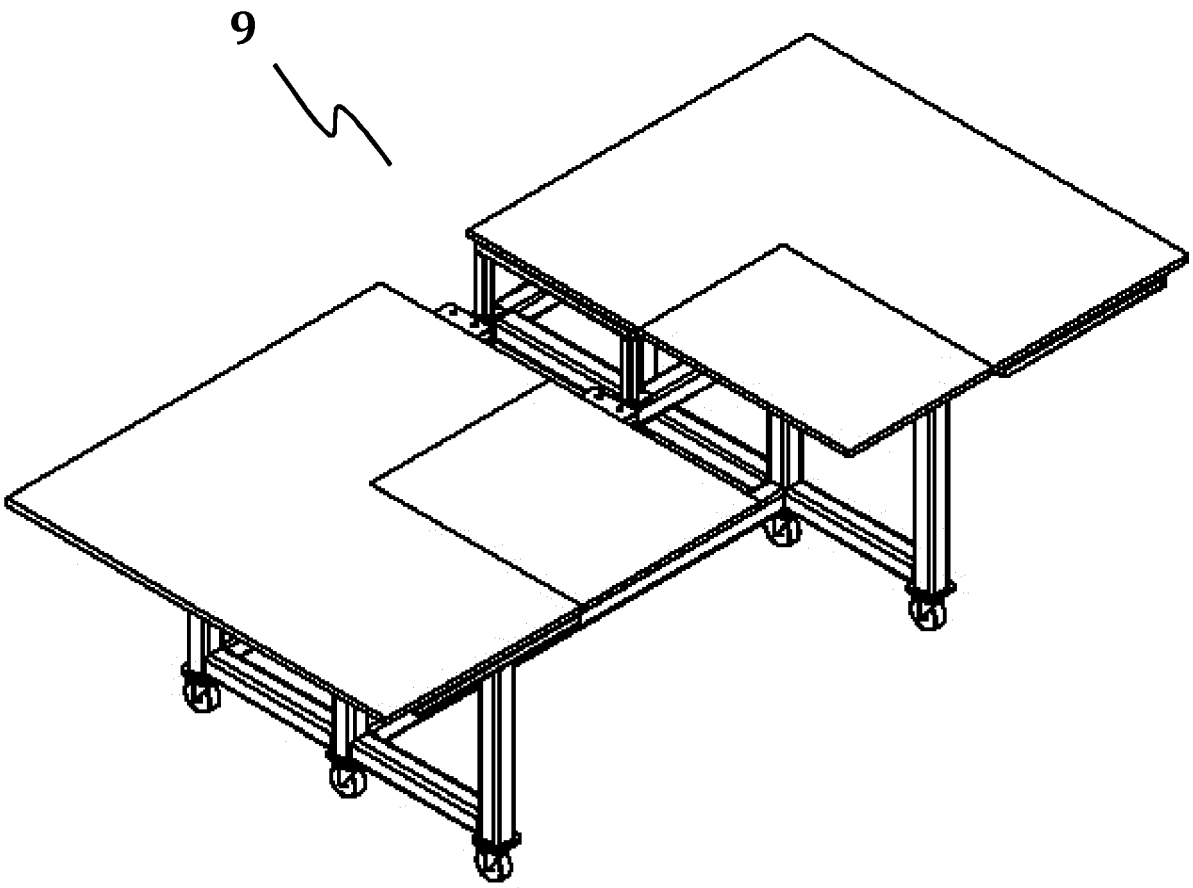

FIG. 9

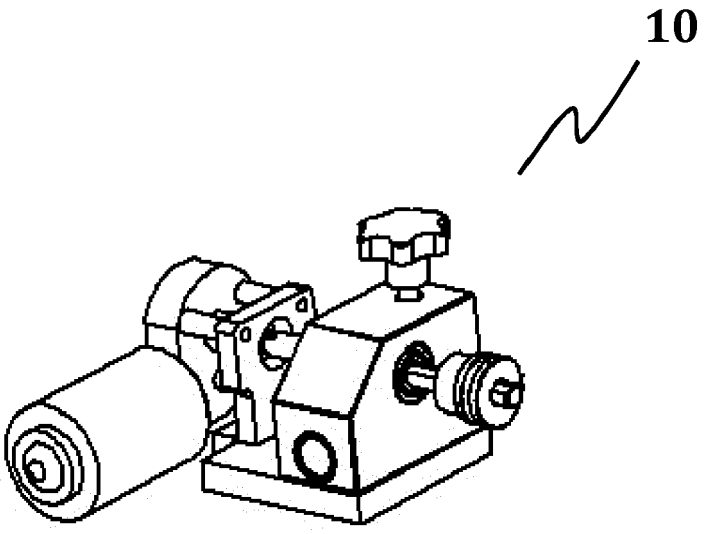

FIG. 10

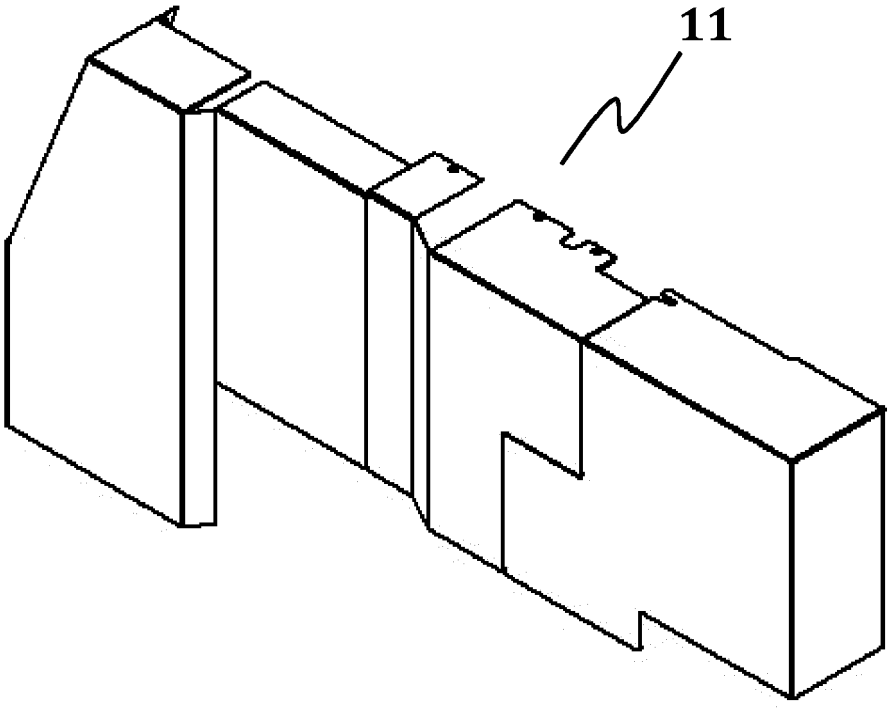

FIG. 11

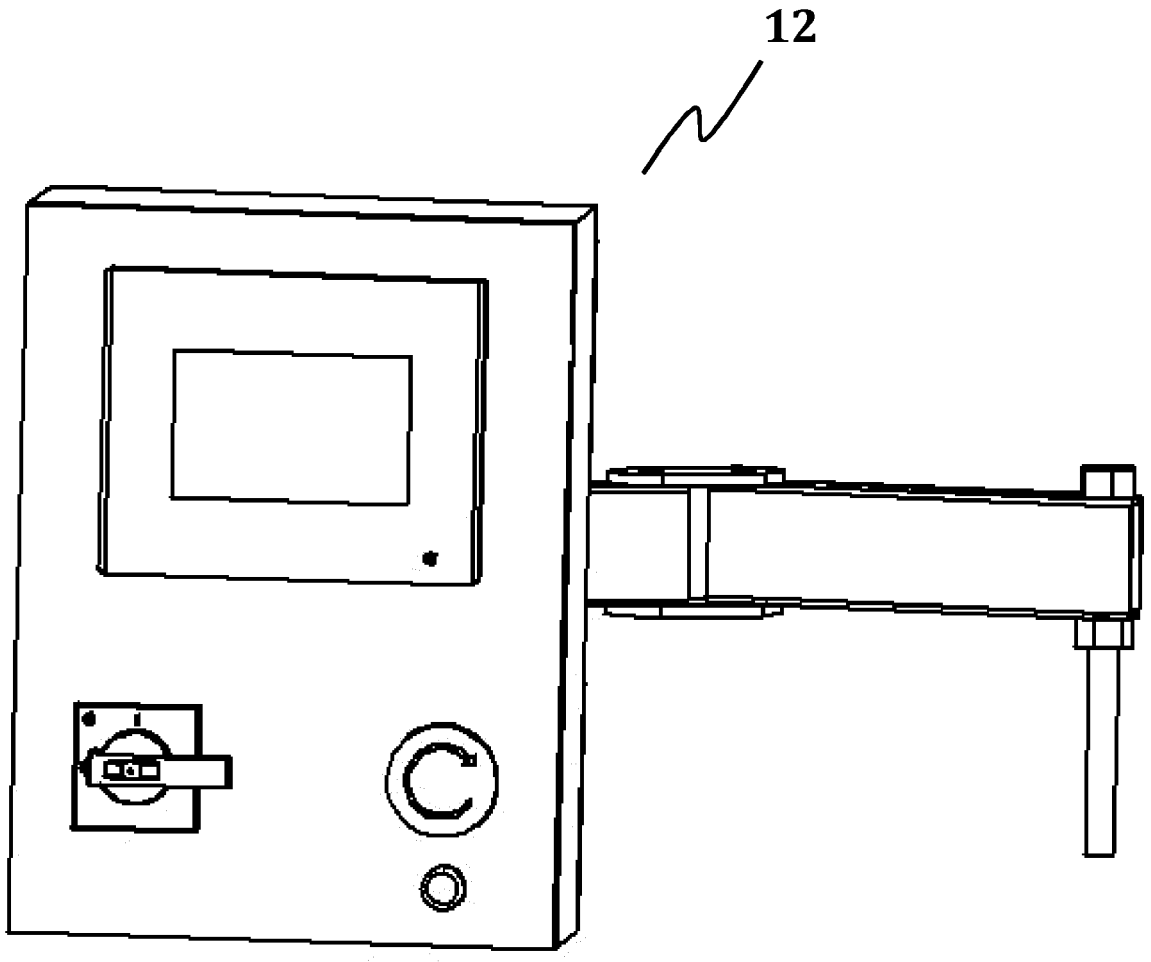

FIG. 12

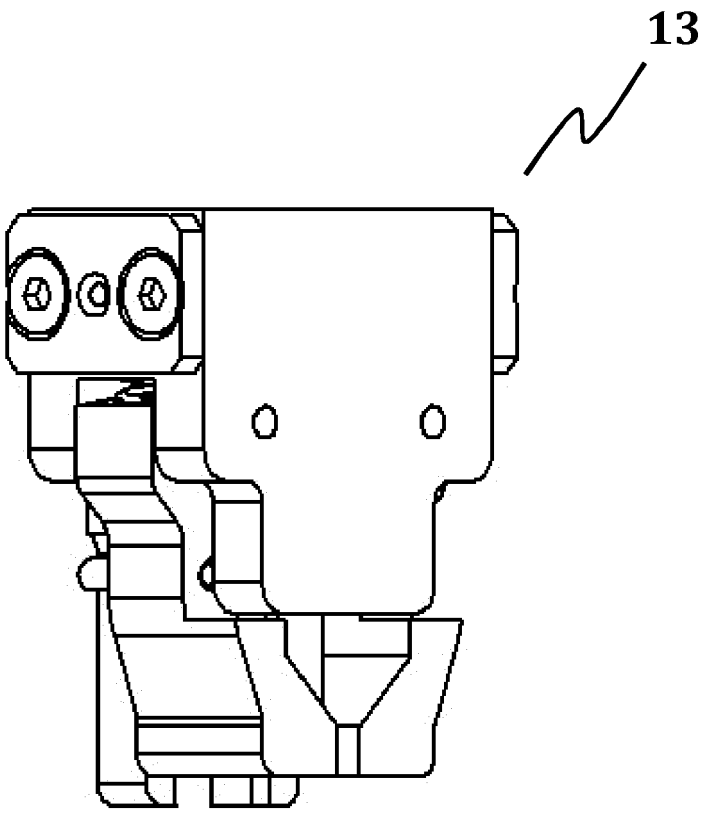

FIG. 13

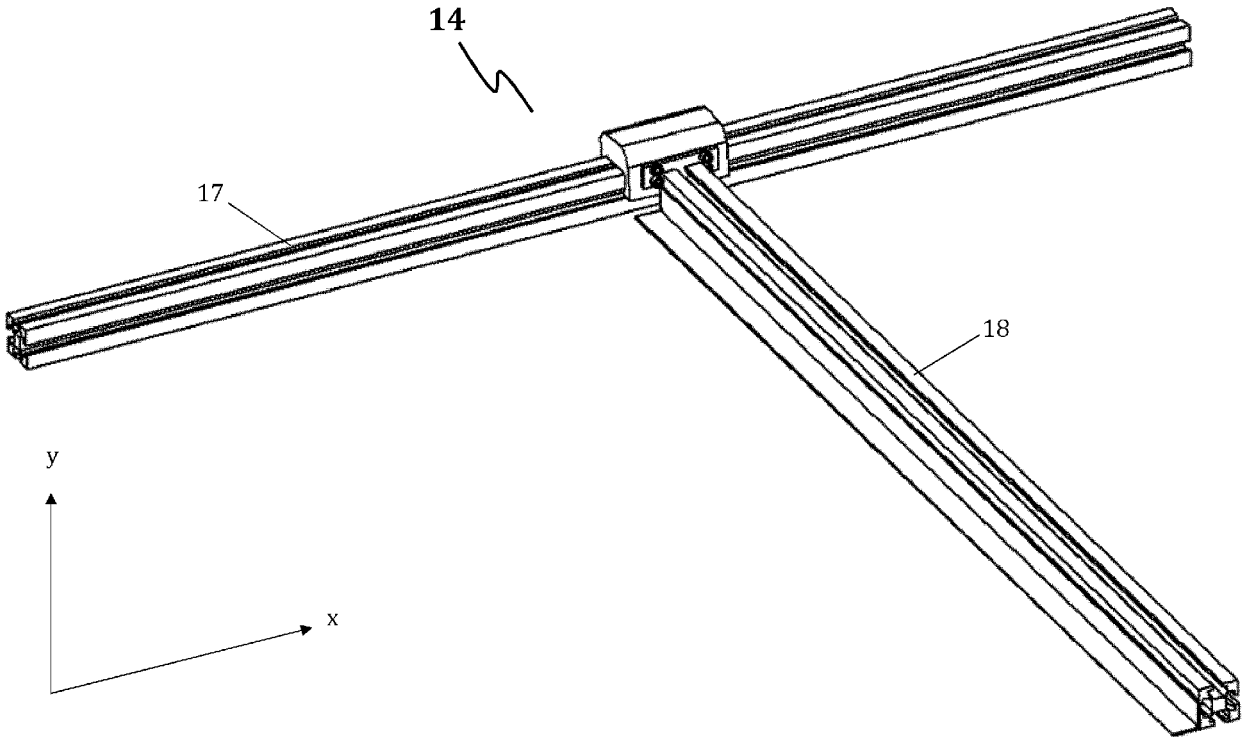

FIG. 14

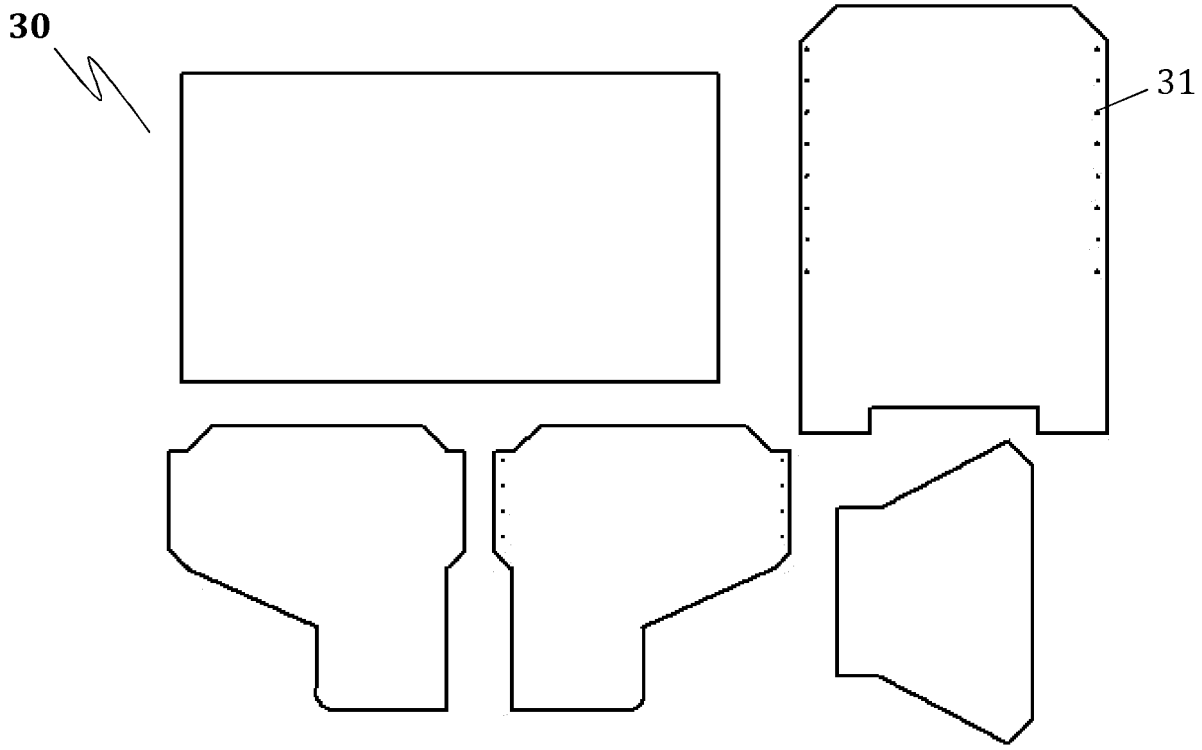

FIG. 15

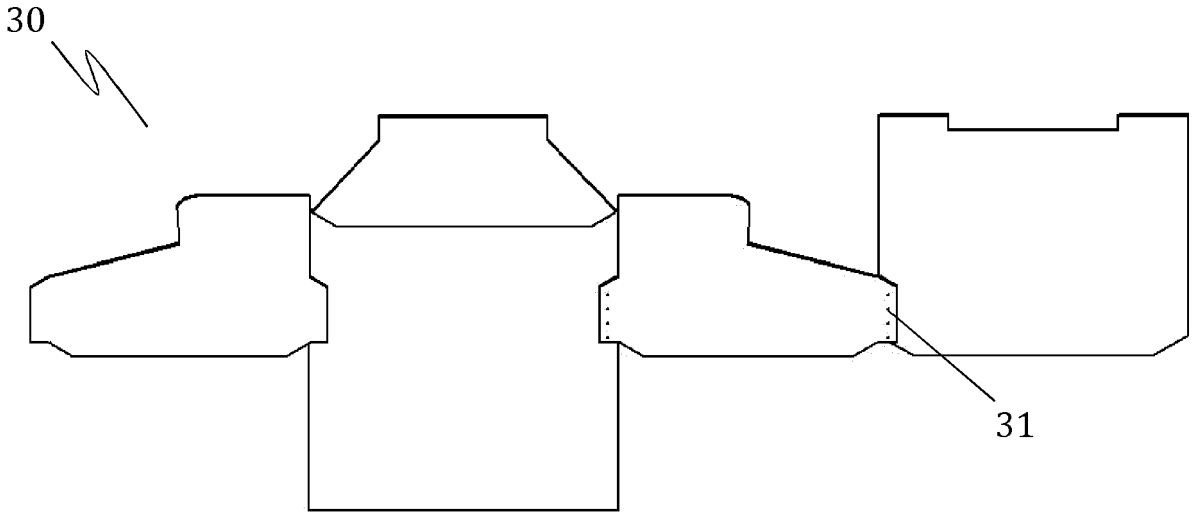

FIG. 16

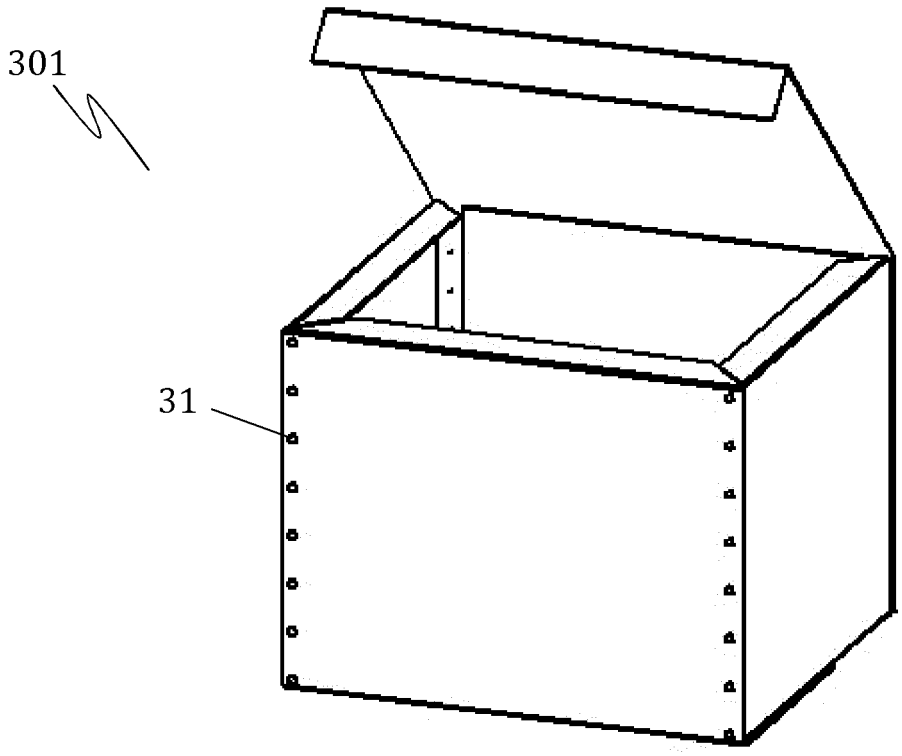

FIG. 17

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 18 17 9033

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 Y	US 3 995 359 A (RANDOLPH ARTHUR J) 7 December 1976 (1976-12-07) * abstract * * figures * * column 7, line 29 - line 47 * * column 9, line 9 - line 10 * * column 9, line 19 * * column 9, line 40 - line 45 *	1-5,10 6-8	INV. A41H37/00 A41H37/10 A41H43/02
X	DE 36 16 902 C1 (STOCKO METALLWARENFAB HENKELS) 27 August 1987 (1987-08-27) * abstract * * column 4, line 61 - column 5, line 21 * * figure 3 *	1-3,10	
X Y	FR 1 466 699 A (UNITED CARR INC) 20 January 1967 (1967-01-20) * page 1, line 19 - line 23 * * page 1, line 25 - line 36 * * page 2, line 13 - line 44 * * figure 1 *	1,10,11 12	
			TECHNICAL FIELDS SEARCHED (IPC)
X	FR 2 326 377 A1 (ALEPEE ETS [FR]) 29 April 1977 (1977-04-29) * page 1, line 16 - line 32 * * figures *	1,9,10	A41H
Y	DE 33 13 351 A1 (PRYM WERKE WILLIAM [DE]) 18 October 1984 (1984-10-18) * abstract * * page 14, line 1 - page 15, line 35 * * figure 1 *	6	
Y	DE 195 31 176 C1 (STOCKO FASTENERS GMBH [DE]) 28 November 1996 (1996-11-28) * abstract * * column 5, line 10 - line 16 * * figure 2 *	7	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 October 2018	Hamel, Pascal

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

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 18 17 9033

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	WO 2013/152440 A1 (RYERSON UNIVERSITY [CA]; XI FENGFENG JEFF [CA]; LIN YU [CA]; DAKDOUK D) 17 October 2013 (2013-10-17) * abstract * * page 10, line 20 - line 26 * -----	8	
Y	WO 2013/003902 A1 (BELLDALE PTY LTD [AU]; KELLY MICHAEL [AU]) 10 January 2013 (2013-01-10) * abstract * * page 16, line 3 - line 8 * * figures * -----	12	

TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 October 2018	Hamel, Pascal

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 17 9033

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-10-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3995359 A	07-12-1976	NONE	
DE 3616902 C1	27-08-1987	DE 3616902 C1	27-08-1987
		EP 0246456 A2	25-11-1987
FR 1466699 A	20-01-1967	NONE	
FR 2326377 A1	29-04-1977	NONE	
DE 3313351 A1	18-10-1984	DE 3313351 A1	18-10-1984
		US 4541558 A	17-09-1985
DE 19531176 C1	28-11-1996	BR 9603549 A	11-04-2000
		DE 19531176 C1	28-11-1996
		EP 0760216 A2	05-03-1997
		ES 2098211 T1	01-05-1997
		JP H09241911 A	16-09-1997
		US 5774364 A	30-06-1998
WO 2013152440 A1	17-10-2013	CA 2869433 A1	17-10-2013
		US 2015101175 A1	16-04-2015
		WO 2013152440 A1	17-10-2013
WO 2013003902 A1	10-01-2013	AU 2012101924 A4	23-04-2015
		AU 2012278928 A1	09-01-2014
		CN 204218167 U	25-03-2015
		US 2014124568 A1	08-05-2014
		WO 2013003902 A1	10-01-2013

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 9802055 A1 **[0003]**
- WO 9830832 A1 **[0004]**
- TR 200301061 **[0005]**