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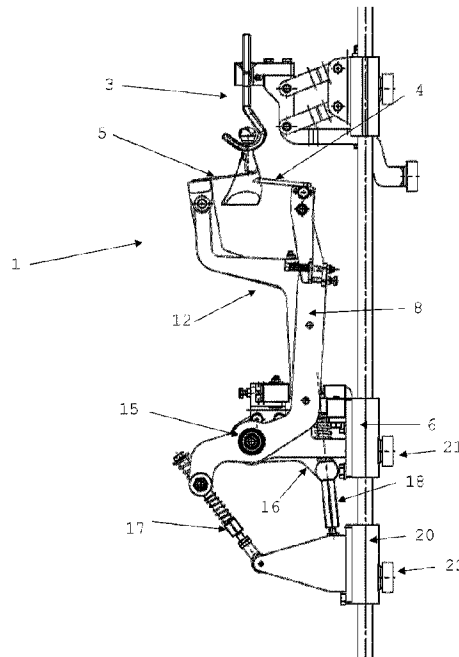
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(54) **Title: DEBONER FOR POULTRY PARTS**



(57) **Abrégé/Abstract:**

A deboner for processing a poultry part being suspended in a conveyor, the deboner being equipped with a first jaw and a second jaw being mounted on an up-and-down movable slide block supporting a first frame portion, a second frame portion, and a third frame portion, wherein the first frame portion and the second frame portion are rotatably mounted on the third frame portion, and wherein the first jaw and the second jaw are movable towards and away from each other, wherein the first jaw is through a first hinge connected with the first frame portion to enable a rotational movement of the first jaw with respect to the first frame portion, and wherein a second hinge pivotably connecting the first frame portion to the third frame portion and a third hinge pivotably connecting the second frame portion with the third frame portion share a common axis of rotation.

ABSTRACT

A deboner for processing a poultry part being suspended in a conveyor, the deboner being equipped with a first jaw and a second jaw being mounted on an up-and-down movable slide block supporting a first frame portion, a second frame portion, and a third frame portion, wherein the first frame portion and the second frame portion are rotatably mounted on the third frame portion, and wherein the first jaw and the second jaw are movable towards and away from each other, wherein the first jaw is through a first hinge connected with the first frame portion to enable a rotational movement of the first jaw with respect to the first frame portion, and wherein a second hinge pivotably connecting the first frame portion to the third frame portion and a third hinge pivotably connecting the second frame portion with the third frame portion share a common axis of rotation.

DEBONER FOR POULTRY PARTS

The invention relates to a deboner for a poultry part, wherein the poultry part to be processed is suspended in a conveyor for moving the poultry part along the deboner to enable processing the poultry part by the deboner, said deboner being equipped with a first jaw and a second jaw that are arranged to engage the poultry part and are movable towards and away from each other between a nonoperative position and an operative position, and which jaws are jointly movable up and down for assuming an initial altitude, respectively for processing the poultry part from said initial altitude.

An apparatus with such features is known from WO2011/093698. Other deboners are disclosed by US 5,203,736; WO2017/131513 and WO93/09675.

A deboner is disclosed by US 9,615,591. Accordingly this deboner is equipped with a first jaw and a second jaw that are mounted on an up-and-down movable frame comprising a first frame portion, a second frame portion, and a third frame portion, wherein the first frame portion is rotatably mounted on the third frame portion, and the second frame portion is rotatably mounted on the third frame portion, and wherein the first jaw and the second jaw are movable towards and away from each other between a nonoperative position and an operative position, wherein the first jaw is through a first hinge connected with the first frame portion so as to enable a rotational movement of the first jaw with respect to the first frame portion.

It is an object of the invention to increase the yield of meat to be stripped from poultry bone in a reliable manner, i.e. to further reduce the adverse effect of variations in size of the poultry parts to the amount of meat that can be harvested therefrom.

According to the invention a deboner is provided that can be suitably used for stripping meat of a poultry drum, thigh, or even a whole leg.

In a broad aspect, the present invention provides a deboner 1 for a poultry part 2, wherein the poultry part 2 to be processed is suspended in a conveyor for moving the poultry part along the deboner 1 to enable processing the poultry part 2 by the

deboner 1, said deboner 1 being equipped with a first jaw 4 and a second jaw 5 that are arranged to engage the poultry part 2 and are mounted on an up-and-down movable slide block 6 supporting a first frame portion 8, a second frame portion 12, and a third frame portion 16, wherein the first frame portion 8 is rotatably mounted on the third frame portion 16, and the second frame portion 12 is rotatably mounted on the third frame portion 16, and wherein the first jaw 4 and the second jaw 5 are movable towards and away from each other, wherein the first jaw 4 is through a first hinge 7 connected with the first frame portion 8 so as to enable a rotational movement of the first jaw 4 with respect to the first frame portion 8, characterized in that a second hinge 15 that pivotably connects the first frame portion 8 to the third frame portion 16 and a third hinge 19 that pivotably connects the second frame portion 12 with the third frame portion 16 share a common axis of rotation.

The common axis of rotation of the first frame portion and the second frame portion result in more accurate placement of the first jaw and the second jaw with respect to each other, which provides better stripping results with higher yield of meat.

It is further preferred that the common axis of rotation is in a vertical plane also comprising a carrier from which the poultry part is suspended. This provides that the common axis of rotation and the carrier from which the poultry part is suspended are exactly vertically aligned with each other, and avoids that the poultry part unnecessarily has to depart from its line of conveyance during processing. Also there is only a minimal torque around the hinges as a result of the scraping forces acting on the poultry part, so opening of the jaws due to scraping forces only occurs over the second and third hinge for better stripping results.

Apart from having the first jaw connected through the first hinge with the first frame portion, it is preferred that the second jaw is connected through a fourth hinge with the second frame portion so as to enable a rotational movement of both the first jaw and the second jaw with respect to the first frame portion and the second portion, respectively, so that both the first jaw and the second jaw can adjust to the dimension of the poultry part.

Suitably at least one of the first jaw and the second jaw is spring-loaded so as to urge the concerning jaw in use towards the poultry part and enable that said jaw passes any knuckle

present in the suspended poultry part.

Preferably however both the first jaw and the second jaw are spring-loaded so as to urge both the first jaw and the second jaw in use towards the poultry part to be processed. Another effect is that since the jaws adjust to the dimension of the poultry part, the jaws are enabled to pass a knuckle present at the end of the bone of the poultry part when said jaws are stripping down the meat.

Suitably the first frame portion is connected to a first actuator for executing a rotational movement of the first frame portion with respect to the third frame portion. This brings the first jaw in operative position for the stripping operation. Likewise the second frame portion is preferably con-

nected to a second actuator for executing a rotational movement of the second frame portion with respect to the third frame portion.

5 The invention is further embodied in a processing line comprising a conveyor with a series of carriers for suspending poultry parts, and at least one deboner according to the invention. Preferably the processing line is provided with a carousel type device with plural deboners.

10 For using a carousel type device with plural deboners, it is preferred that each deboner has the feature that the slide block is provided with a first guide wheel and the first actuator and/or the second actuator are connected to another slide block provided with a second guide wheel, wherein both guide wheels are equipped to cooperate with guide tracks provided at a carousel-drum's circumference such that the slide block's alti-
15 tude is determined by the guide tracks of the carousel-drum.

The invention will hereinafter be further elucidated with reference to the drawing of an exemplary embodiment of a deboner according to the invention that is not limiting as to
20 the appended claims.

In the drawing:

-figures 1 - 3 show a single deboner according to the invention in a side view in three subsequent stages;

25 -figure 4 provides a detailed view at the first jaw;

-figure 5 provides a detailed view at the second jaw;
and

-figure 6 provides an isometric view at the deboner.

Whenever in the figures the same reference numerals are applied, these numerals refer to the same parts.

30 In figures 1 - 3 a deboner 1 for a poultry part 2 is shown, wherein the poultry part 2 is suspended in a conveyor that has a series of carriers. The figures 1 - 3 show for clarity only a single carrier 3 and a single poultry part 2 suspended therefrom. The conveyor with the carrier(s) 3 move poultry
35 part(s) along the deboner 1 so as to enable processing of the poultry part(s) 2 by the deboner 1.

The deboner 1 is equipped with a first jaw 4 and a second jaw 5 that are (eventually) mounted on a slide block 6. The slide block supports a first frame portion 8, a second frame
40 portion 12 and a third frame portion 16, as will be discussed further hereinafter. The jaws 4, 5 are movable towards and away

from each other between a nonoperative position (figure 1) and an operative position (figure 3) in which the jaws 4, 5 engage the poultry part 2 that is being processed. Figure 2 represents an intermediate position between the nonoperative position of figure 1 and the operative position of figure 3.

Figures 1 - 3 show that the first frame portion 8 is rotatably mounted through a second hinge 15 on the third frame portion 16. Like the first frame portion 8 and the second frame portion 12, the third frame portion 16 is supported by slide block 6 which is up-and-down movable. The jaws 4, 5 are thus arranged to be jointly movable up and down for assuming an initial altitude which is shown in figure 3. After this initial altitude as shown in figure 3 has been assumed, the jaws 4, 5 can be moved down for processing, that is stripping the meat from the poultry part starting at said initial altitude. This is all clear for the skilled person and requires no further elucidation.

In figures 4 - 6 specific features are shown that contribute to the effectiveness and high yield of the deboner 1 of the invention.

In figure 4 it is shown that the first jaw 4 is through a first hinge 7 eventually supported by the first frame portion 8 so as to enable a rotational movement of the first jaw 4 with respect to the first frame portion 8. Accordingly the first jaw 4 can adjust to a dimension of the poultry part to be processed. This includes adjustment to any knuckle present in the poultry part. The first jaw 4 is preferably spring-loaded with a spring 9 that engages a lever arm 10 of the first jaw 4 so as to urge the first jaw 4 in use towards the poultry part.

Figure 5 shows that also the second jaw 5 is connected through a fourth hinge 11 with the second frame portion 12 so as to enable a rotational movement of not only the first jaw 4, but also the second jaw 5, the latter with respect to the second frame portion 12. In this manner both the first jaw 4 and the second jaw 5 can adjust to the dimension of the poultry part or to the knuckles present therein. Figure 5 further shows the preferable feature that also the second jaw 5 is spring-loaded with a spring 13 engaging a lever arm 14 of the second jaw 5, so as to urge the second jaw 5 in use towards the poultry part to be processed.

Figure 6 further shows that the first frame portion 8

is connected to a first actuator 17 for executing a rotational movement of the first frame portion 8 with respect to the third frame portion 16. Likewise the second frame portion 12 is rotatably mounted through a third hinge 19 with the third frame portion 16, wherein further the second frame portion 12 is connected to a second actuator 18 for executing a rotational movement of the second frame portion 12 with respect to the third frame portion 16.

To support the operation of plural deboners of the invention in combination with a carousel type device, it is further shown that in each deboner, the slide block 6 is provided with a first guide wheel 21 and the first actuator 17 and the second actuator 18 are connected to another slide block 20 provided with a second guide wheel 21, wherein both guide wheels 21, 22 are equipped to cooperate with guide tracks (not shown but extensively known to the skilled person) provided at a carousel-drum's circumference such that the slide blocks' 6, 20 altitude is determined by the guide tracks of the drum.

Finally it is shown that the second hinge 15 of the first frame portion 8 and the third hinge 19 of the second frame portion 12 share a common axis of rotation.

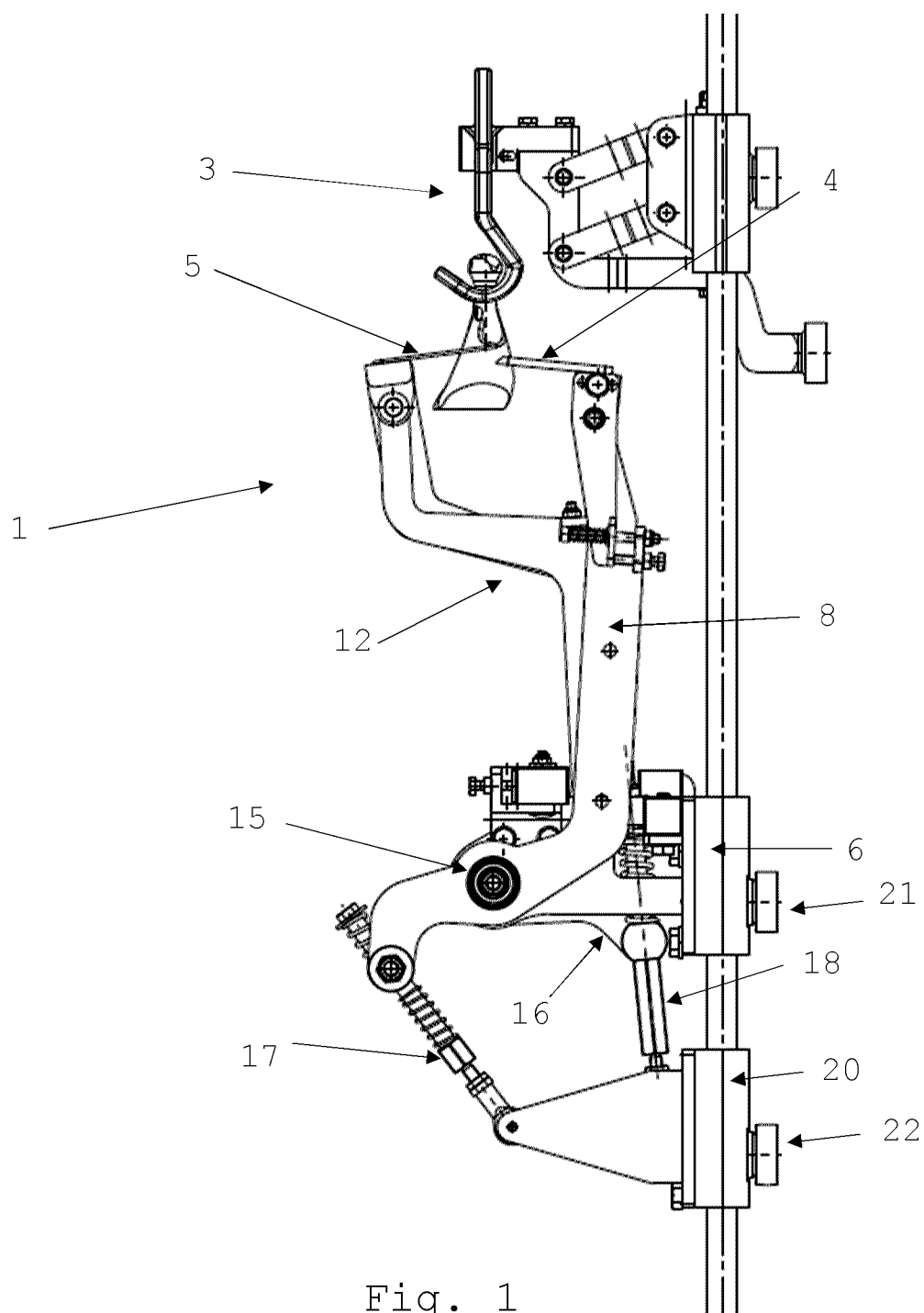
Although the invention has been discussed in the foregoing with reference to an exemplary embodiment of the deboner of the invention, the invention is not restricted to this particular embodiment which can be varied in many ways without departing from the invention. The discussed exemplary embodiment shall therefore not be used to construe the appended claims strictly in accordance therewith. On the contrary the embodiment is merely intended to explain the wording of the appended claims without intent to limit the claims to this exemplary embodiment. The scope of protection of the invention shall therefore be construed in accordance with the appended claims only, wherein a possible ambiguity in the wording of the claims shall be resolved using this exemplary embodiment.

CLAIMS

1. A deboner (1) for a poultry part (2), wherein the poultry part (2) to be processed is suspended in a conveyor for moving the poultry part along the deboner (1) to enable processing the poultry part (2) by the deboner (1), said deboner (1) being equipped with a first jaw (4) and a second jaw (5) that are arranged to engage the poultry part (2) and are mounted on an up-and-down movable slide block (6) supporting a first frame portion (8), a second frame portion (12), and a third frame portion (16), wherein the first frame portion (8) is rotatably mounted on the third frame portion (16), and the second frame portion (12) is rotatably mounted on the third frame portion (16), and wherein the first jaw (4) and the second jaw (5) are movable towards and away from each other, wherein the first jaw (4) is through a first hinge (7) connected with the first frame portion (8) so as to enable a rotational movement of the first jaw (4) with respect to the first frame portion (8), **characterized in that** a second hinge (15) that pivotably connects the first frame portion (8) to the third frame portion (16) and a third hinge (19) that pivotably connects the second frame portion (12) with the third frame portion (16) share a common axis of rotation.
2. The deboner of claim 1, wherein the conveyor comprises a series of carriers (3) for suspending the poultry part, **characterized in that** the common axis of rotation and a carrier (3) from which the poultry part is suspended are exactly vertically aligned with each other.
3. The deboner of claim 1 or 2, **characterized in that** the second jaw (5) is connected through a fourth hinge (11) with the second frame portion (12) so as to enable a rotational movement of the second jaw (5) with respect to the second portion (12), so that both the first jaw (4) and the second jaw (5) can adjust to the dimension of the poultry part.
4. The deboner of any one of claims 1 - 3, **characterized in that** at least one of the first jaw (4) and the second jaw (5)

is spring-loaded so as to urge the at least one of the first jaw (4) and the second jaw (5) towards the poultry part and enable that the at least one of the first jaw (4) and the second jaw (5) passes any knuckle present in the suspended poultry part.

5. The deboner of any one of claims 1 - 4, **characterized in that** the first jaw (4) and the second jaw (5) are both individually spring-loaded so as to individually urge both the first jaw (4) and the second jaw (5) in use towards the poultry part and enable said jaws to pass any knuckle present in the suspended poultry part.
6. The deboner of any one of claims 1 - 5, **characterized in that** the first frame portion (8) is connected to a first actuator (17) for executing a rotational movement of the first frame portion (8) with respect to the third frame portion (16).
7. The deboner according to any one of claims 1 - 6, **characterized in that** the second frame portion (12) is connected to a second actuator (18) for executing a rotational movement of the second frame portion (12) with respect to the third frame portion (16).
8. The deboner according to any one of claims 1, 6 or 7, **characterized in that** the slide block (6) is provided with a first guide wheel (21) and that at least one of the first actuator (17) and the second actuator (18) is connected to another slide block (20) provided with a second guide wheel (22), both guide wheels (21, 22) being equipped to cooperate with guide tracks provided at a carousel-drum's circumference such that the slide blocks' (6, 20) altitude is determined by the guide tracks of the carousel-drum.
9. Processing line comprising the conveyor with the carriers (3) for suspending poultry parts (2), and the deboner (1) according to any one of claims 1 - 8.



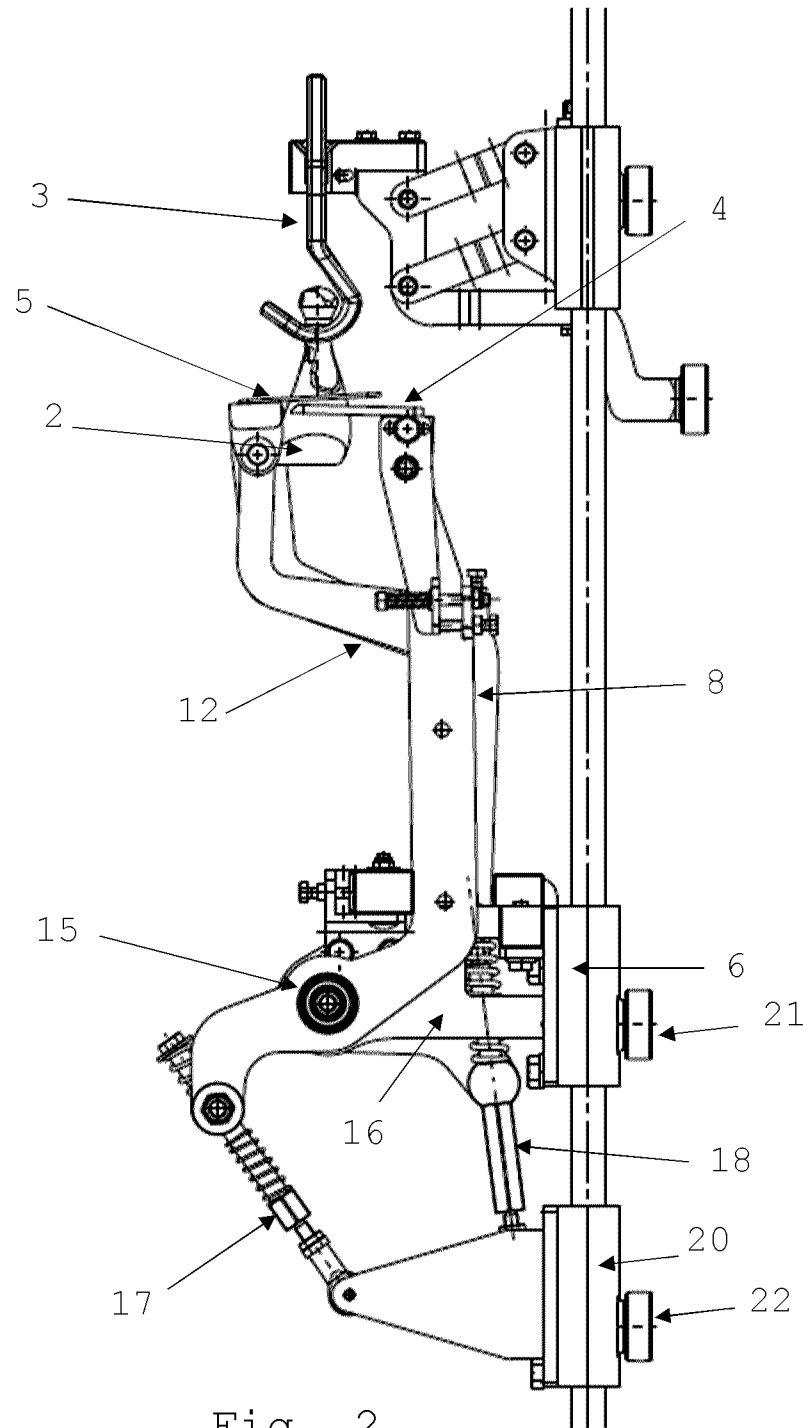


Fig. 2

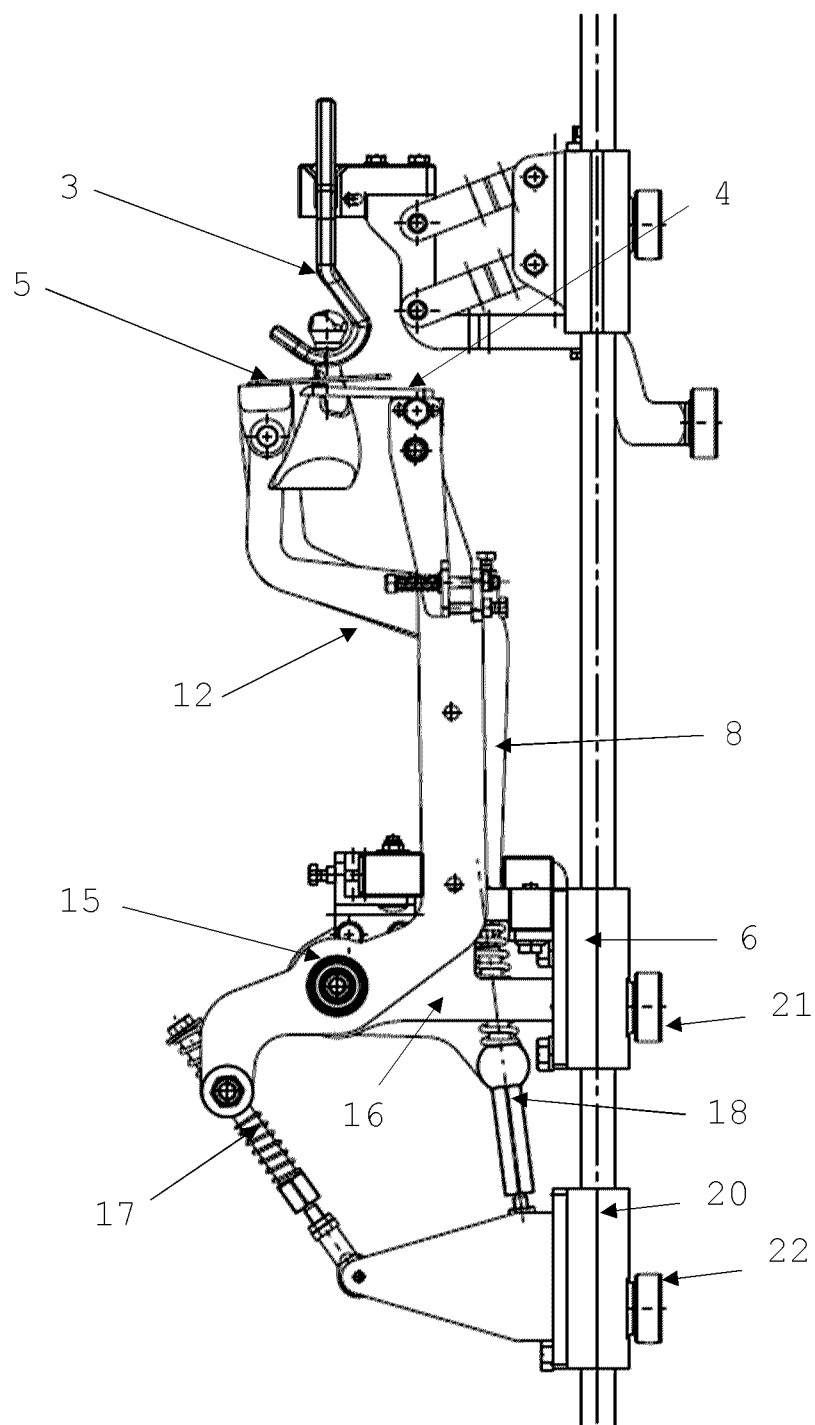


Fig. 3

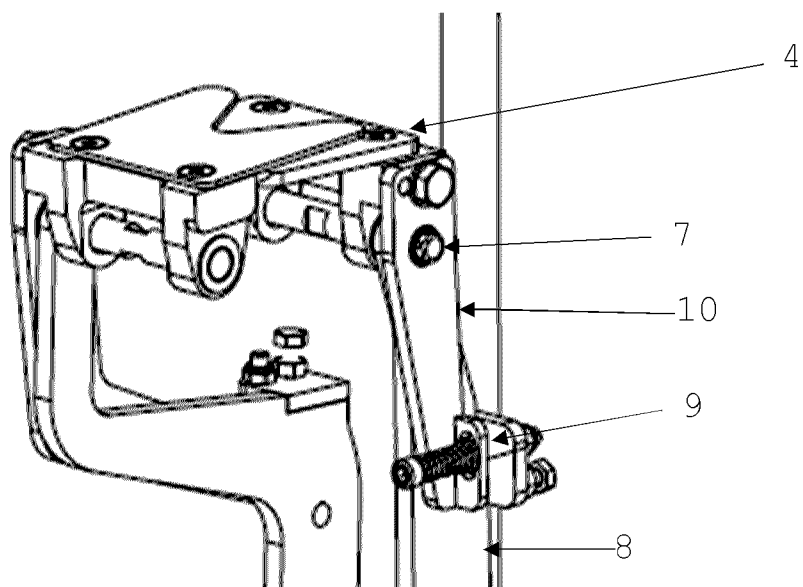


Fig. 4

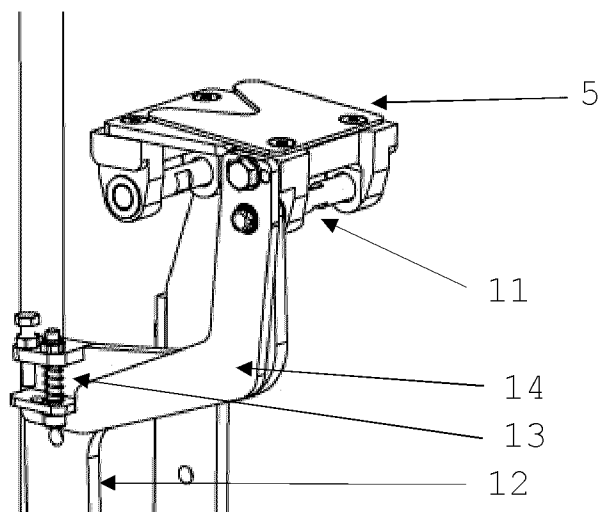


Fig. 5

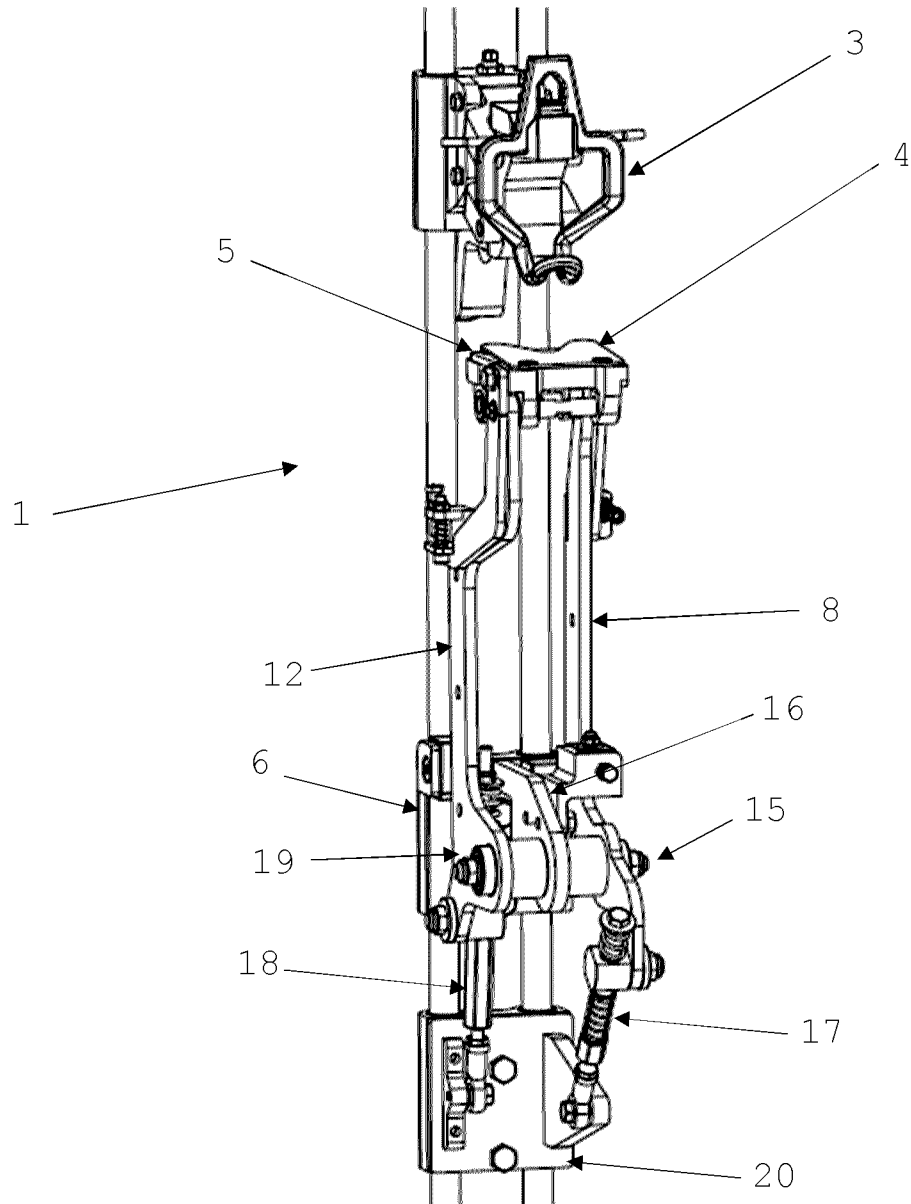


Fig. 6

