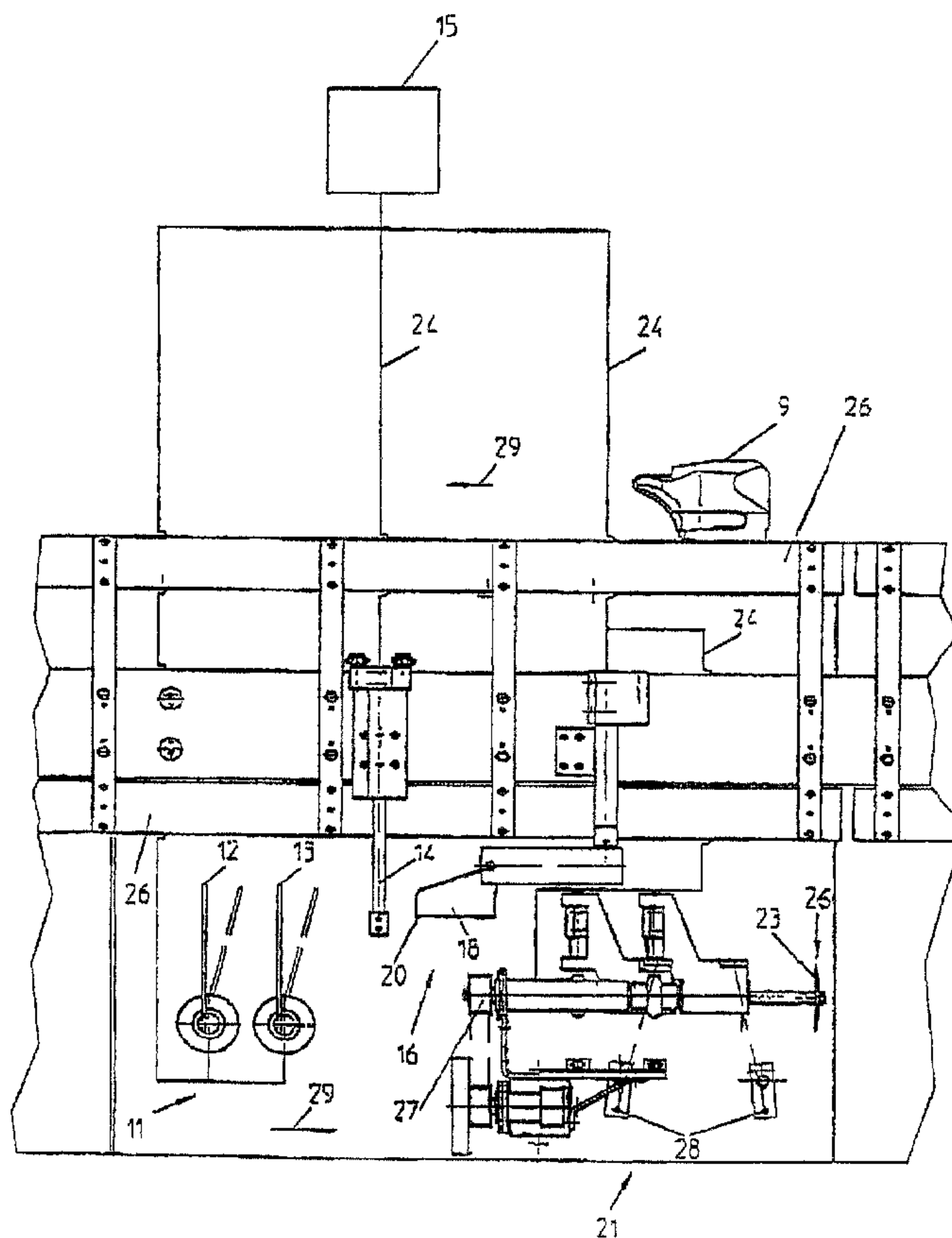




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(54) Titre : DISPOSITIF POUR ENLEVER DES FILETS  
 (54) Title: FILLETING DEVICE



(57) **Abrégé/Abstract:**

The invention relates to a device for removing the fillets from dressed bodies of poultry whose extremities have been detached. The inventive device comprises at least one measuring device for measuring the individual dimensions of the body, at least one control unit, and at least one scraping device, whereby the measuring device is connected via the control unit to the at least one scraping device for the purpose of communicating.



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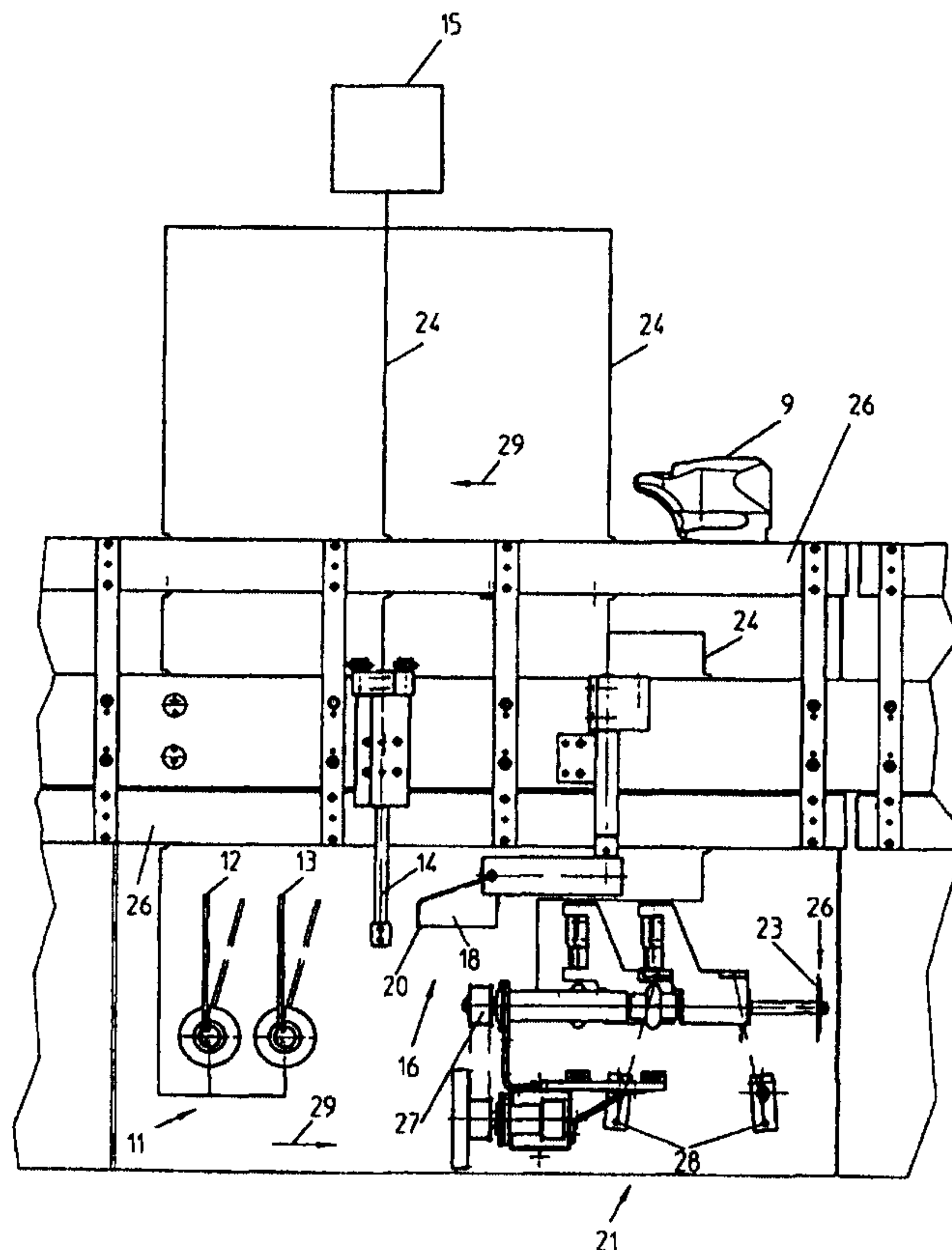
(54) Bezeichnung: FILETIERVORRICHTUNG

(57) Abstract

The invention relates to a device for removing the fillets from dressed bodies of poultry whose extremities have been detached. The inventive device comprises at least one measuring device for measuring the individual dimensions of the body, at least one control unit, and at least one scraping device, whereby the measuring device is connected via the control unit to the at least one scraping device for the purpose of communicating.

(57) Zusammenfassung

Vorrichtung zum Entfernen der Filets von den ausgenommenen Körpern extremitätenlosen Geflügels, umfassend, wenigstens eine Meßvorrichtung zur Erfassung der individuellen Körpermaße, wenigstens eine Steuerungseinheit und wenigstens eine Schabevorrichtung, wobei die Meßvorrichtung über die Steuerungseinheit mit der wenigstens einen Schabevorrichtung zum Zweck der Kommunikation verbunden ist.



**FILLETING DEVICE**

The invention relates to a device and a method for removing the fillets from the eviscerated carcasses of poultry whose extremities have been detached.

10 From EP A1 168 865 is known a device of this kind which is designed to remove the head portion of the wishbone (clavicula), wherein this operation is however before a filleting process whose result is a double fillet including the breast meat in the form of outer and inner fillets. With this device, the poultry carcasses present as front halves are mounted on the saddles of a rotationally driven conveyor, so that the saddle horn extends into the neck opening and the breast portion faces upwards. Filleting of the poultry carcass being conveyed with the neck opening in front is effected on the lower run of the device and begins with retention of the breast meat and hence stripping thereof from the wishbone to the breastbone (sternum) and is continued by a scraping tool which is adapted to the shape of the 20 poultry carcass and, by penetration between skeleton and meat, causes separation of the meat up to the keel of the breastbone (crista sterni). By means of scraping fingers which then follow, detachment from the flanks of the breastbone is effected in its region of transition to the breastbone plate (corpus sterni) and finally complete separation of the double fillet by means of rotationally driven peeling belts. A further practical example of this state of the art provides as the first filleting tool a pair of milling rollers which lift the fillet meat 30 located in the region of the ribs off the skeleton. Behind this tool is a scraping tool after the fashion of the one described above, which causes separation of the meat up to the keel of the breastbone. Complete separation of the double fillet is finally again undertaken by a tool consisting of rotationally driven peeling belts.

**Amended sheet**

From EP-A1 207 553 is known a further device for recovery of the meat from poultry carcasses in the form of double fillets. Here too the starting product is the front half of a poultry carcass which is inverted over the saddle horn of a saddle which forms part of a revolving conveyor. On inversion, the wing joints and hence the points of application of the wishbone are kept forced inwards, and the poultry carcass is thus supplied to the filleting tools which are arranged along the lower run of the conveyor and recover the fillet meat essentially by pushing it off.

10

A further device and a method for the mechanical recovery of meat from poultry carcasses can be found in document EP 591 741. The device shown there for removal of the fillets includes several processing tools. The processing tools constructed as scraping devices are connected to a control mechanism by which the scraping elements are controlled, wherein control or activation of the tools is effected in each case as a function of the size of the products to be processed.

All known devices or methods for the recovery of fillets have the drawback that, due to the different geometries of the naturally grown carcasses, it is frequently not possible to obtain an optimum of fillet meat at the same time as a visually pleasing product.

20

It is now the object of the present invention to increase the yield of fillet meat, at the same time with a visually pleasing product.

According to the present invention, there is provided a device for removing fillets from eviscerated carcasses of poultry whose extremities have been detached, including at least one measuring device for measuring individual carcass dimensions, at least one control unit and at least one scraping device, characterised in that the measuring device is connected via the control unit to the at least one scraping device for the purpose of communicating, wherein the

30

measuring device is for detecting body joint points and the at least one scraping device is constructed as a disc-like scraping element. This ensures that firstly exact data on the individual carcass dimensions can be determined, so that an increased yield can be obtained, as the points of application or engagement of the scraping device can be determined precisely. Secondly the disc-like construction of the or each scraping device ensures careful penetration between skeleton and meat, so that injuries, particularly to the bones, can be effectively avoided. Thus the quality of the fillet meat obtained is improved, because for example bone residues in the fillet are prevented.

10 In a preferable development of the invention, the or each scraping elements is of rotatable construction. Due to the rotating scraping elements, initial detachment or cutting is made easier, with the result that on the one hand an improvement in quality and on the other hand an increase in yield is obtained.

Preferably, according to the invention it is provided that at least one scraping device comprises an element for pulling back the tender sinew. This increases the reliability of initial cutting still further and leads to fillets free from damage.

20 Further it may be provided according to the invention that the or each scraping device comprises at least two disc-like scraping elements.

Preferably the disc-like scraping elements are of pivotable construction such that the circumferential surfaces of their discs are arranged so that they can be rolled over the wishbone from the body joint of the poultry carcass. This construction ensures that clean separation of the fillet meat from the skeleton is carried out, so that the yield is further increased.

30 Preferably, according to the invention, there is provided that in front of each scraping device in the direction of conveying is arranged at least one measuring device.

According to the present invention, there is also provided a method for removing fillets from eviscerated carcasses of poultry whose extremities have been detached, including the steps of:

- introducing the carcasses of poultry into the device;
  - detection of the individual carcass dimensions by recording carcass-specific data,
  - control of the at least one scraping device and mounting of the at least one scraping element on previously determined body joint points,
  - subsequent detachment of the fillets from the skeleton by the at least one disc-like scraping element, and
- 10 final and complete detachment of the fillets by subsequent scraping tools.

By this method according to the invention, exact separation of the meat from the skeleton with maximum yield is possible. Furthermore, the method according to the invention ensures very careful separation of the fillets from the skeleton so that damage, due to which for example bone residues remain in the fillet, can be prevented.

20 A practical example of the device according to the invention is described in more detail with the aid of the drawings. They show:

Figure 1 a stripped view of the poultry carcass

Figure 2 a simplified side view of a poultry carcass on a saddle with activated clamping lever

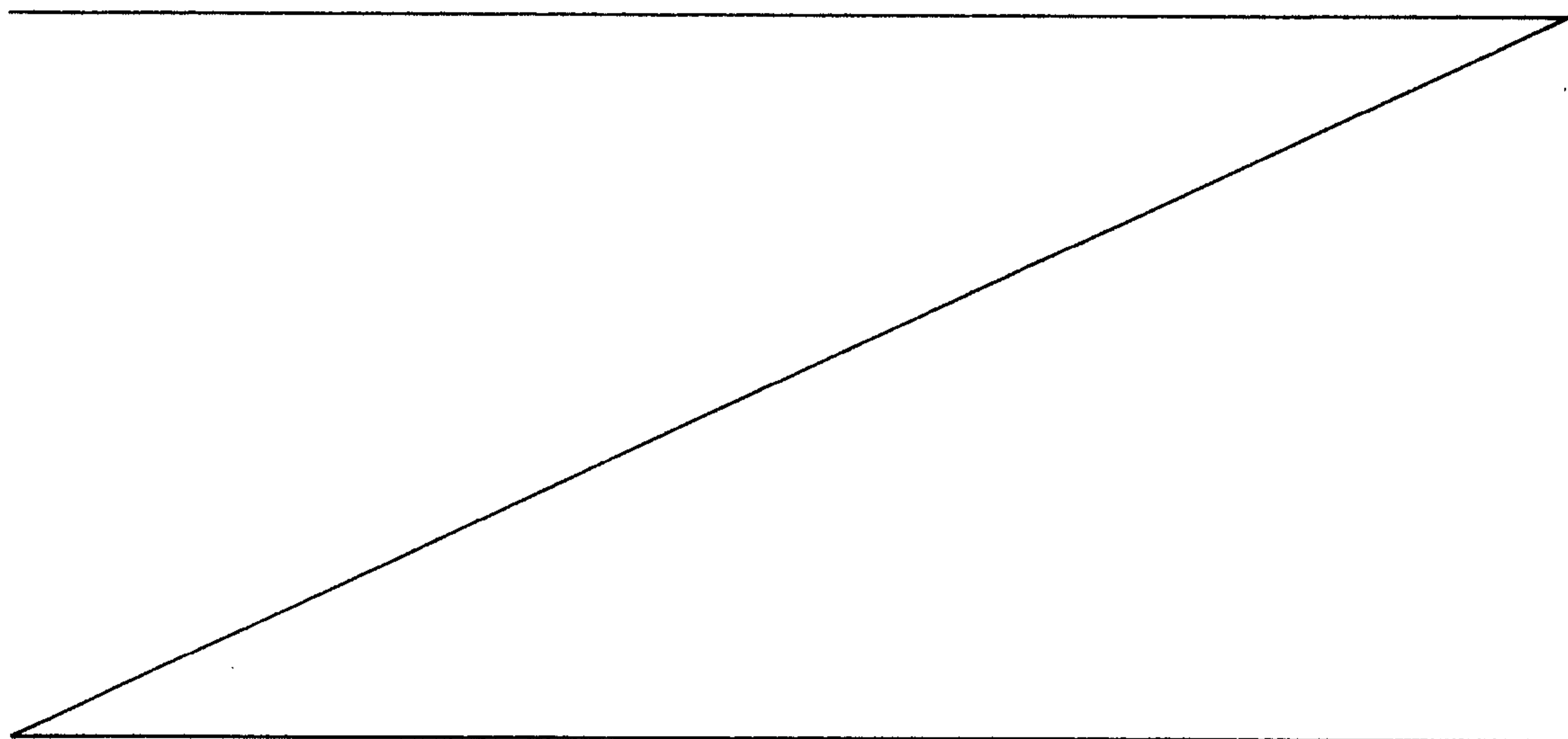
Figure 3 a side view of a detail of a poultry processing device

Figure 4 a top view according to Figure 3.

30 In Figure 1 is shown part of a poultry carcass 1 with reference to its bone structure which essentially consists of a breastbone 2, from which the coracoid bones 3 extend forwards, or in the direction of conveying 29.

The wishbone 4, which extends as far as the wishbone head 5, is connected by the body joints 6 to the coracoid bones 3. This poultry carcass 1 is mounted on a saddle 9 which is in turn fixed in a frame, not shown in more detail, of a device for recovery of the breast meat from slaughtered poultry on an endlessly rotating conveyor 26. The part of the poultry carcass 1 which is shown in Figure 1 is produced by an oblique cut transversely through the poultry carcass 1, wherein the cut is made while separating the pelvis with the legs and while cutting through the vertebral column roughly parallel to the ribs connected to the vertebral column.

In Figure 2 is shown a poultry carcass 1 on a saddle 9 in a side view, the poultry carcass 1 being pressed against the saddle 9 by means of the activated clamping lever 8. The inner contour of the breastbone plate 10 rests on the saddle 9. Essentially the poultry carcass 1 consists of the breastbone 2, from which the coracoid bones 3 extend in the direction of the body joints 6. The wishbone 4, which extends as far as the wishbone head 5, is connected to the coracoid bones 3 by the body joints 6 to which are also attached the scapulae 7. The poultry carcass 1 is mounted on a saddle 9 which is fixed in a



frame, not shown in more detail, of a device for recovery of the breast meat from slaughtered poultry on an endlessly rotating conveyor 26.

In the view according to Figure 3 can be seen a side view of a poultry processing device, as can be seen for example in EP 168 865, particularly in Figure 1 there.

10 The poultry carcass, not shown, which as described in Figures 1 and 2 is located on the saddles 9 arranged at regular intervals on the endlessly rotating conveyor 26, passes with its breastbone plate facing downwards into the input region of the measuring device 11.

20 This is because the arrangement of the device for removing the fillets selected in the embodiment shown is mounted below the endlessly rotating conveyor 26. In this way the ultimately removed fillet drops, assisted by gravity, into a collecting vessel suitably arranged below the device. In the region of the measuring device 11 the poultry carcass which is moved by means of conveyor 26 must successively pass in the direction of conveying 29 through a first measuring element 12 and a second measuring element 13, wherein the measuring element 12 is important for detection of one body joint, and the measuring element 13 is important for detection of the other body joint. As can be seen from Figure 1, the body joints 6 are arranged essentially parallel and adjacent to each other in one plane, so that it follows that the measuring elements 12 and 13 are mounted with offset tracks according to the distance between the body joints 6. After the measuring elements 12 and 13, the poultry carcass passes through a third measuring element 14 which  
30 consists of two elements. These two elements are arranged in one plane and resemble double swing doors. The signals obtained individually from the measuring elements just described in relation to the respective dimensions of the poultry carcasses are transmitted directly to a control unit 15 by means of the signal wires 24 and serve

essentially for individual identification of the position of the body joints of each individual poultry carcass which passes by means of conveyor 26 into the region of the device for recovery of the fillet. But it is also possible with the device shown to make statements regarding the height, width and length of the poultry carcass. The control unit 15 now signals the arrival of each poultry carcass, but in particular the position of the body joints 6 of the respective poultry carcass, to the first scraping device 16. This scraping device 16 consists of a left scraping element 17 and a right scraping element 18, wherein these scraping elements 17, 18 arranged adjacent to each other essentially simulate the contour of the poultry carcass from the viewpoint of the approaching poultry carcass. The scraping elements 17, 18 are arranged pivotably relative to each other, so that they can be spaced apart e.g. by means of a signal from the control unit 15 in relation to the individual width of the poultry carcass. The left scraping element 17 has a left sinew restraint device 19 which is intended to find and restrain the tender sinew located in the region of the body joint, so that the scraping element can pass unhindered into the region between bone and meat and so obtain an optimum yield. The right scraping element 18 has a right sinew restraint device 20 which is intended to find the corresponding tender sinew located on the opposite body joint. After the first scraping device is located a second scraping device 21 which, arranged essentially symmetrically to the direction of conveying, comprises a left disc 22 and a right disc 23 which are preferably made of metal, wherein these discs 22, 23 can be driven with a disc drive 27. These discs 22, 23 are slidable by means of disc pivot levers 28 in such a way that, the moment the control unit 15 indicates via the signal wires 24 the appearance of the body joints 6 of the poultry carcass within range of the second

scraping device, the circumferential surface 25 of the discs 22, 23 moves towards the corresponding body joint and abuts against it. In the course of the movement of the poultry carcass caused by the conveyor 26 the discs 22, 23 move on the corresponding part of the symmetrical wishbone 4 towards its wishbone head 5 in order to detach the meat connected to the wishbone 4. After reaching the wishbone head, the rotating discs 22, 23 are steered out of direct range of the poultry carcass. In a special  
10 embodiment the discs 22, 23 are blunt, particularly in the region of their circumferential surface 25.

In a further alternative embodiment it is provided that in the region between first scraping device 16 and second scraping device 21 is arranged a further measuring device 11 for checking the carcass coordinates, which may possibly have changed after a processing operation.

In another alternative embodiment it is provided that the scraping devices 16, 21 already described above are arranged in the reverse order, so that the poultry carcass passes through first the scraping device 21 and  
20 then the scraping device 16, wherein here too the additional alternative that a further measuring device is arranged between the scraping devices 21, 16 is conceivable.

In the view according to Figure 4 can be seen a side view and a top view of a poultry processing device according to Figure 3. In the region of the measuring device 11, the poultry carcass which is moved with the conveyor 26 shown in Figure 3 must pass successively in  
30 the direction of conveying 29 through a first measuring element 12 and a second measuring element 13, wherein the measuring element 12 is important for detection of one body joint 6, and the measuring element 13 is important for detection of the other body joint 6, which are shown in Figure 1. As can be seen from Figure 1, the body joints 6 are arranged essentially parallel and adjacent

to each other in one plane, so that it follows that the measuring elements 12 and 13 are mounted with offset tracks according to the distance between the body joints 6, which can be seen in particular in Figure 4 II. After the measuring elements 12 and 13, the poultry carcass passes through a third measuring element 14 which consists of two elements, the left element 30 and the right element 31. These two elements are arranged in one plane and resemble double swing doors. The signals  
10 obtained individually from the measuring elements just described in relation to the respective dimensions of the poultry carcasses are transmitted directly to a control unit 15 by means of the signal wires 24 shown in Figure 3 and serve essentially for individual identification of the position of the body joints as well as the volume and external dimensions of each individual poultry carcass which passes by means of conveyor 26 into the region of the device for recovery of the fillet. The control unit  
20 15 which can also be seen in Figure 3 now indicates the arrival of each poultry carcass, but in particular the position of the body joints 6 of the respective poultry carcass, to the first scraping device 16. This scraping device 16 consists of a left scraping element 17 and a right scraping element 18. The scraping elements 17, 18 are arranged pivotably relative to each other, so that they can be spaced apart e.g. by means of a signal from the control unit 15 in relation to the individual width of the poultry carcass. The left scraping element 17 has a left sinew restraint device 19 which is intended to  
30 find and restrain the tender sinew located in the region of the body joint, so that the scraping element can pass unhindered into the region between bone and meat and so obtain an optimum yield. The right scraping element 18 has a right sinew restraint device 20 which is intended to find the corresponding tender sinew located on the opposite body joint. After the first scraping device is

located a second scraping device 21 which, arranged essentially symmetrically to the direction of conveying, comprises a left disc 22 and a right disc 23, wherein these discs 22, 23 can be driven with a disc drive 27 which can be driven with a drive belt, not shown in more detail, by a motor, also not shown. These discs 22, 23 are slidable by means of disc pivot levers 28 in such a way that, the moment the control unit 15 indicates via the signal wires 24 the appearance of the body joints 6 of the poultry carcass within range of the second  
10 scraping device, the circumferential surface 25 of the discs 22, 23 moves towards the corresponding body joint and abuts against it. In the course of the movement of the poultry carcass caused by the conveyor 26, the discs 22, 23 move on the corresponding part of the symmetrical wishbone 4 towards its wishbone head 5 in order to detach the meat connected to the wishbone 4. After reaching the wishbone head, the rotating discs 22, 23 are again steered out of direct range of the poultry carcass. In a  
20 special embodiment the discs 22, 23 are blunt, particularly in the region of their circumferential surface 25.

In another alternative embodiment according to Figure 4 III it is provided that the scraping devices 16, 21 already described above are arranged in the reverse order, so that the poultry carcass passes through first the scraping device 21 and then the scraping device 16, wherein here too the additional alternative that a further measuring device is arranged between the scraping  
30 devices 21 and 16 is conceivable. In a further alternative embodiment it is provided that the measuring device 11 has a photooptical element, e.g. a camera which in conjunction with a processor unit and a mathematical process, such as for example triangulation, determines volume and carcass data, or its coordinates, e.g. the wishbone shape.

List of reference numbers

- 1 poultry carcass
- 2 breastbone
- 3 coracoid bone
- 4 wishbone
- 5 wishbone head
- 6 body joint
- 7 shoulder blades
- 8 clamping lever
- 10 9 saddle
- 10 breastbone plate
- 11 measuring device
- 12 first measuring element
- 13 second measuring element
- 14 third measuring element
- 15 control unit
- 16 first scraping device
- 17 left scraping element
- 18 right scraping element
- 20 19 left sinew restraint device
- 20 right sinew restraint device
- 21 second scraping device
- 22 left disc
- 23 right disc
- 24 signal wire
- 25 disc circumferential surface
- 26 conveyor
- 27 disc drive
- 28 disc pivot lever
- 30 29 direction of conveying
- 30 left element
- 31 right element

**WHAT IS CLAIMED IS:**

1. Device for removing fillets from eviscerated carcasses of poultry whose extremities have been detached, including at least one measuring device for measuring individual carcass dimensions, at least one control unit and at least one scraping device, characterised in that the measuring device is connected via the control unit to the at least one scraping device for the purpose of communicating, wherein the measuring device is for detecting body joint points and the at least one scraping device is constructed as a disc-like scraping element.
- 10 2. Device according to claim 1, characterised in that two scraping devices are provided.
3. Device according to claim 1 or 2, characterised in that each scraping device comprises at least two disc-like scraping elements.
4. Device according to any one of claims 1 to 3, characterised in that each scraping element is of rotatable construction.
5. Device according to any one of claims 1 to 4, characterised in that the at  
20 least one scraping device comprises an element for pulling back tender sinew.
6. Device according to any one of claims 1 to 5, characterised in that the at least one disc-like scraping element is of pivotable construction and has discs having circumferential surfaces that, in operation, roll over a wishbone from a body joint of the carcass of the poultry.
7. Device according to any one of claims 1 to 6, characterised in that in front of each scraping device in a direction of conveying is arranged the at least one measuring device.

8. Method for removing fillets from eviscerated carcasses of poultry whose extremities have been detached, including the steps of:

- introducing the carcasses of poultry into the device according to any one of claims 1 to 7,
- detection of the individual carcass dimensions by recording carcass-specific data,
- control of the at least one scraping device and mounting of the at least one scraping element on previously determined body joint points,
- subsequent detachment of the fillets from the skeleton by the at least one disc-like scraping element, and
- final and complete detachment of the fillets by subsequent scraping tools.

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9. Method according to claim 8, characterised in that the step of detection is effected by mechanical sensing of the body joint points.

10. Method according to claim 8 or 9, characterised in that two sides of the poultry carcass are processed one after the other.

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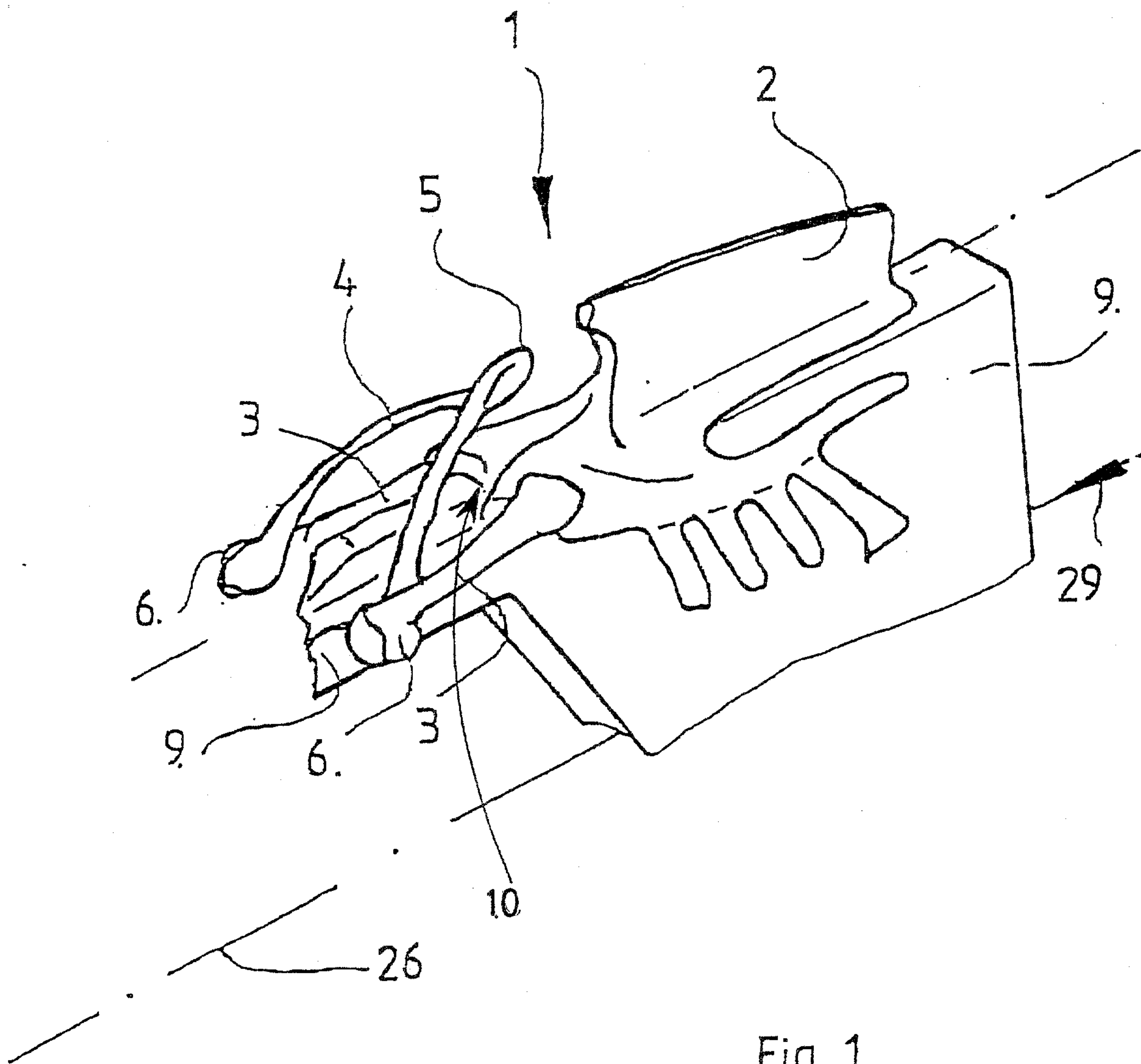


Fig. 1

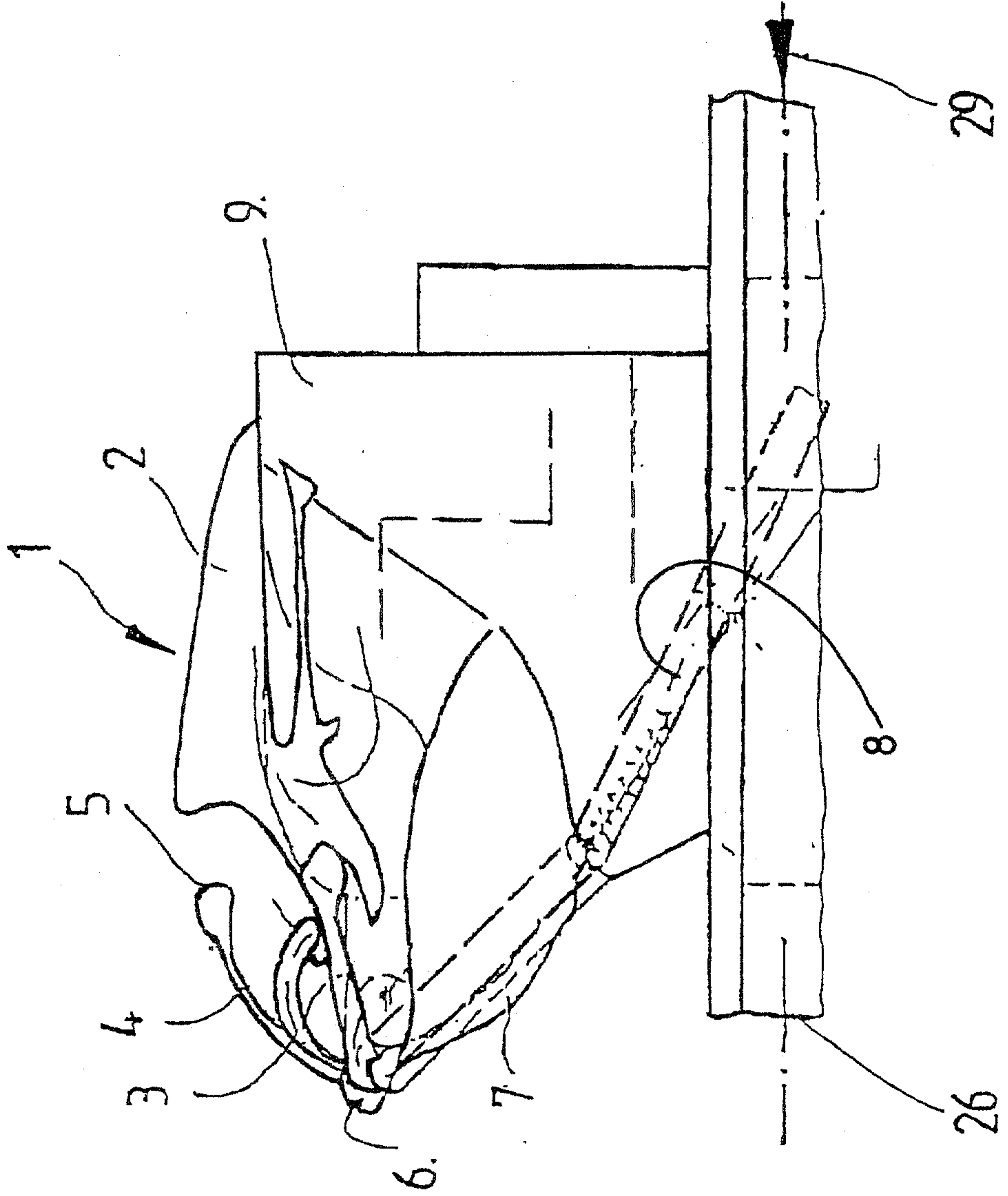


Fig. 2

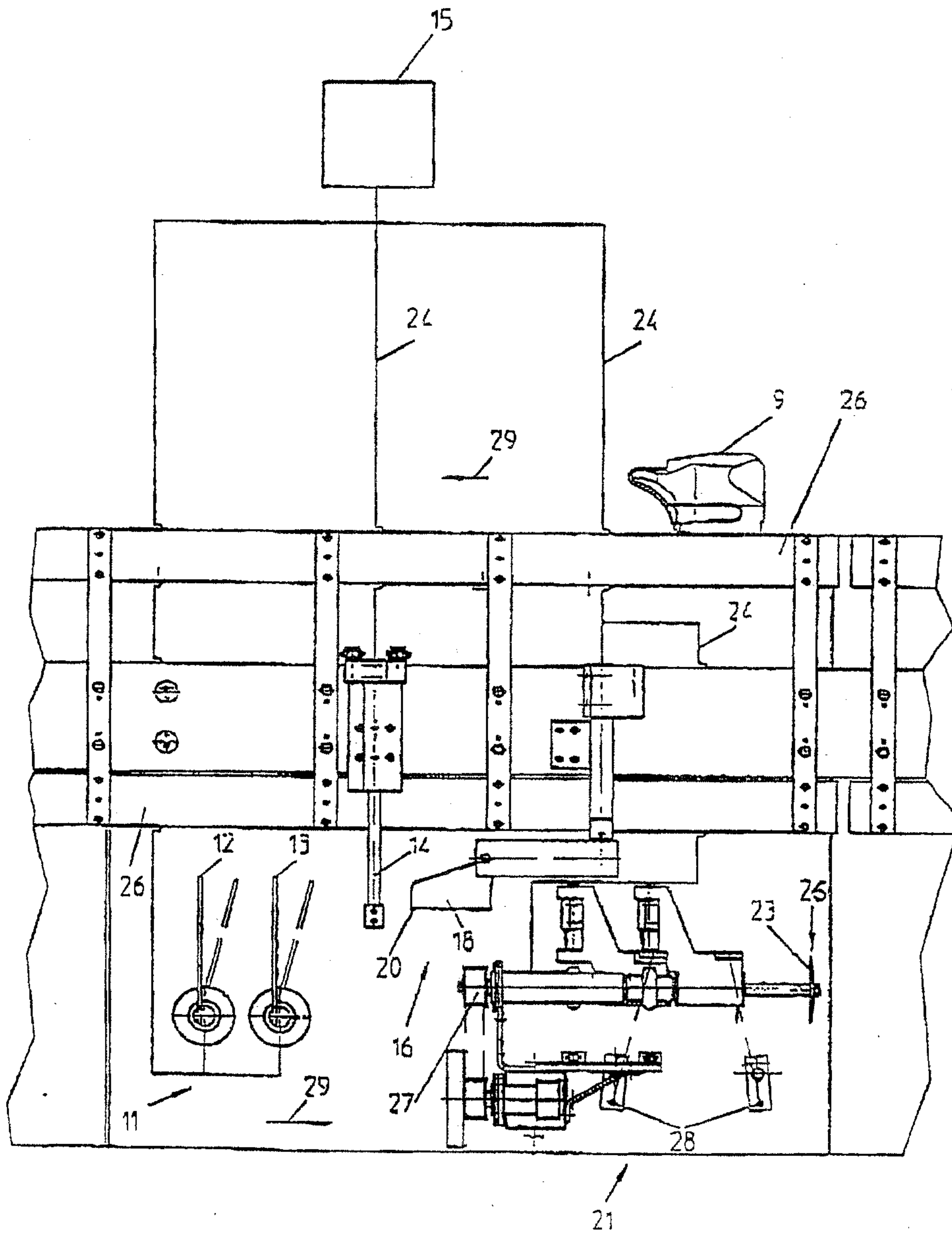


Fig. 3

