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**WO-A2-00/41568**



# DESCRIPTION

## Description

**[0001]** The invention relates to a system for rehanging poultry which is suspended by the head in a first shackle of a first shackle conveyor to a second shackle of a second shackle conveyor in which the poultry is or will be suspended by the legs.

**[0002]** WO2014/026695 discloses a method and system for suspending a bird by the legs from a shackle, wherein the following sequence of steps are executed: 1) bending at least one leg at the ankle joint so that the foot comes nearer to the breast of the bird, 2) inserting the leg in a shackle, 3) at least partially releasing the leg. The bending of the leg may be achieved by arranging an engagement member at the breast side of the leg to hinder a movement of the ankle joint towards the breast of the bird and using a carrier for forcing the foot towards the breast. The bending at the ankle joint results in a pull on tendons and muscles in the legs, which in turn causes the digits to come closer together and the foot to clench. An even tighter clenching may be achieved by extending the knee joint. This bending of the legs of the birds so that the digits come together is required in the prior art to provide that the feet take considerably less space and the legs are easier to introduce in the openings of the shackle from which the poultry will be suspended by the legs.

**[0003]** WO00/41568 discloses in accordance with the preamble of claim 1 a system for rehanging poultry which is suspended by the head in a first shackle of a first shackle conveyor to a second shackle of a second shackle conveyor in which the poultry is or will be suspended by the legs, wherein the system comprises a leg positioning unit arranged to support the poultry at the legs while the poultry is maintained suspended by the head in the first shackle of the first shackle conveyor, and wherein the system comprises a movable takeover unit which is movable towards the second shackle of the second shackle conveyor for moving the legs of the poultry into the second shackle of the second shackle conveyor, wherein the movable takeover unit is arranged to be operational at least when the leg positioning unit supports the poultry at the legs.

**[0004]** It is an object of the invention to provide an effective and flexible system for automatically rehanging poultry which is suspended by the head, into poultry which will be suspended by the legs. The system of WO2014/026695 does not provide this capability. The system of WO00/41568 lacks flexibility and is unsuited for high processing rates.

**[0005]** It is a further object of the invention to provide such a system which is reliable, does not require much maintenance, and is well-equipped to cope with high processing rates in the rehanging operation.

**[0006]** The system of the invention is therefore provided with the features of the appended claims.

**[0007]** According to the invention the movable takeover unit is independently and separate from the leg positioning unit movable towards the second shackle of the second shackle conveyor and is arranged to act directly on the legs of the poultry to move the legs of the poultry into the second shackle of the second shackle conveyor. The system of the invention enables a complete automated method of rehanging wherein the poultry is first suspended by the head and is converted into being suspended by the legs, and wherein first a step of supporting the poultry at the legs is carried out while the poultry is maintained suspended by the head in the first shackle of the first shackle conveyor, then a further step of engaging the legs of the poultry is carried out with the movable takeover unit acting directly on the legs when the poultry is supported at the legs, and a step of moving the movable takeover unit that are directly acting on the legs towards the second shackle of the second shackle conveyor to move the legs of the poultry into the second shackle of the second shackle conveyor

**[0008]** It is preferable that the leg positioning unit comprises a hook arranged to engage the legs of the poultry while suspended by the head. A hook is a well-known device in the poultry industry and is a robust instrument to perform the leg positioning operation.

**[0009]** Suitably the hook of the leg positioning unit is arranged to follow an essentially circular path in approaching the legs to eventually engage the legs of the poultry, which circular path terminates at a position where the legs of the poultry extend obliquely or sideways away from where the poultry is suspended by the head. When the legs of the poultry extend obliquely or sideways away they are in an appropriate position to be further engaged by the movable takeover unit, as detailed hereinafter.

**[0010]** Preferably the movable takeover unit is arranged to engage the legs of the poultry in an upward movement of the takeover unit ending adjacent to where the leg positioning unit engages the legs of the poultry. Accordingly the takeover unit engages the legs of the poultry in a well-defined position, which is desirable in an automated operation as envisaged by the invention.

**[0011]** It is preferred that the leg positioning unit and/or the movable take-over unit engage the legs at or near the ankle at the ankle's front side, preferably above the ankle at a drum side of the legs. Accordingly a certain bending of the legs is caused which is helpful in correctly orienting the legs when the legs are later in the rehanging method moved by the takeover unit to the shackle from which the poultry will be suspended.

**[0012]** To enable easy movement of the poultry legs by the takeover unit later in a later instance to the shackle, it is further preferred that the movable takeover unit is engaging the legs at a position which is more distant from the first shackle where the poultry is suspended by the head, than the distance of the leg positioning unit to the first shackle while said leg positioning unit is engaging the legs of the poultry.

**[0013]** Suitably the movable takeover unit is provided with first slits for receiving therein the legs of the poultry.

**[0014]** It is further desirable that the movable takeover unit is provided with restricting elements for preventing removal of the legs from the first slits of the movable takeover unit. This secures that the poultry legs are not lost once the suspension of the poultry by the head is released, which causes the poultry to flip to a headdown orientation. Correspondingly it is desirable that the system is arranged to release the head from the first shackle after the movable takeover unit has engaged the legs of the poultry, and more preferably that the system is arranged to release the head from the first shackle after the restricting elements of the movable takeover unit are actuated to prevent removal of the legs from the first slits in which the legs of the poultry are received.

**[0015]** Suitably the movable takeover unit is arranged to move the legs of the poultry towards the second shackle of the second shackle conveyor in an essentially horizontal motion. Mechanization of the motion is then easily accomplished.

**[0016]** Preferably the system comprises the second conveyor which is provided with a series of second shackles.

**[0017]** It is further preferred that the (or each) second shackle is provided with essentially vertical slits for receiving and retaining the legs of the poultry, wherein the movable takeover unit is arranged to move downwards after the movable takeover unit with the legs of the poultry has been moved towards the second shackle of the second shackle conveyor, so as to move the legs for their retainment down into said essentially vertical slits of the second shackle.

**[0018]** In particular wherein the second shackle comprises an upper horizontal rod distant from and above the second slits, the movable take-over unit is arranged to move the feet extending from the legs above and beyond the upper horizontal rod, and then to move the legs downwards so that the feet engage the upper horizontal rod and the toes of the feet are moved into the second shackle prior to movement of the legs into said essentially vertical second slits of the second shackle. The movable takeover unit is arranged to move the legs in the downward movement into the second slits once the toes are securely arranged within said second shackle. Accordingly the movable takeover unit is moved downwards after said movable takeover unit has moved the legs of the poultry above the second shackle of the second shackle conveyor such that the feet extending from the legs of the poultry project beyond the upper horizontal rod of said second shackle, so as to assume a proper starting position for subsequently moving the legs for their retainment down into the second shackle. During the downward movement of the takeover unit, the feet are first engaging the upper horizontal rod of the second shackle and by the continued downward movement of the takeover unit the toes of the feet are arranged to enter into the second shackle. In this way, the risk that the legs will eventually not move into the essentially vertical slits of the second shackle is reduced.

**[0019]** A conventional second shackle can be used for suspending the poultry by the legs. Such a conventional shackle comprises a central vertical bar, wherein on a lower end of said central vertical bar and connected to said central vertical bar, two first rods diverge away from each other and connect to a lower horizontal rod distant from the central bar, wherein on opposite ends of the lower horizontal rod, said horizontal rod bends into two upwardly extending second rods that eventually connect to the central vertical bar, and wherein the two first rods and the two second rods delimit and define slits between the two first rods and the two second rods for receiving and retaining the legs of poultry suspended by the legs from the second shackle.

**[0020]** Rather than using a conventional second shackle it is preferred to use a shackle, wherein the two upwardly extending second rods merge into an upper horizontal rod distant from the lower horizontal rod, which upper horizontal rod is fixed in position at a predetermined distance from the central vertical bar. Accordingly it is easier to move the legs of the poultry into the second shackle when the movable takeover unit moves downwards following its motion towards the second shackle, during which downward movement the legs of the poultry are moved for their retainment down into the essentially vertical slits of the second shackle.

**[0021]** Suitably the upper horizontal rod of the shackle is connected to the central vertical bar with an intermediate connection piece.

**[0022]** The invention will hereinafter be further elucidated with reference to the drawing of a sequence of operations of an exemplary embodiment of a system for rehanging poultry according to the invention that is not limiting as to the appended claims.

**[0023]** In the drawing:

- figure 1 shows a system of the invention for rehanging poultry, with such poultry to be rehanged;
- figure 2 shows the operation of a leg positioning unit forming part of the system of the invention;
- figure 3A shows the operation of a movable takeover unit engaging the poultry legs;
- figure 3B shows the movable takeover unit in an isometric view;
- figure 4 shows the movable takeover unit with closed retaining elements to secure the legs of the poultry;
- figure 5 shows the poultry with the head released and suspended by the legs from the movable takeover unit;
- figure 6 shows the movable takeover unit after approaching the shackle from which the poultry will be suspended from the legs, wherein the legs extend above an upper part of the shackle;
- figure 7 shows the movable takeover unit in a downward moved position by which the poultry legs are introduced into the shackle of figure 6;
- figure 8 shows the movable takeover unit in a further downward moved position after the poultry legs are introduced into the shackle of figure 6

- figure 9 shows the final position of the movable takeover unit before it is released from the poultry legs and moved away from the shackle of figure 6;
- figure 10 shows a conventional shackle for suspending the poultry by the legs;
- figure 11 shows a shackle;
- figures 12 - 14 show several subsequent stages of movement of the movable takeover unit in a different embodiment of the system of the invention which is equipped with a dedicated breast support for the poultry.

**[0024]** Whenever in the figures the same reference numerals are applied, these numerals refer to the same parts.

**[0025]** The operation of the system for rehangng poultry according to the invention is illustrated with reference to figures 1-9, which show a sequence of operations of different parts of the system.

**[0026]** Figure 1 shows poultry 1 suspended by the head 2 in a first shackle 3 of a first shackle conveyor. The system of the invention is designed to rehang this poultry 1 into a position in which it will eventually be suspended by the legs from a second shackle 4 of a second shackle conveyor.

**[0027]** Figure 1 shows that the system comprises a leg positioning unit 5 in a not yet operational position. Figure 1 clearly shows that the leg positioning unit 5 comprises a hook 5' arranged to engage the legs 6 of the poultry 1 while suspended by the head 2.

**[0028]** In figure 2 the leg positioning unit 5 is shown after it has become operational and has engaged the legs 6 of the poultry 1. Figure 2 shows that the leg positioning unit 5 is arranged to support the poultry 1 at the legs 6 while the poultry 1 is maintained suspended by the head 2 in the first shackle 3 of the first shackle conveyor.

**[0029]** Figure 1 and figure 2 show that the leg positioning unit 5 is mounted on a hinge 8 which arranges that the hook 5' of the leg positioning unit 5 follows an essentially circular path in approaching the legs 6 of the poultry 1 wherein it eventually engages the legs 6 of the poultry 1. Said circular path terminates at a position where the legs 6 of the poultry 1 extend obliquely or sideways away from where the poultry 6 is suspended by the head 2. This last aspect is also shown in figure 2.

**[0030]** A movable takeover unit 7 which is designed to operate directly on the legs 6 of the poultry 1 as is shown in figures 3A and 3B, is arranged to become operational after the leg positioning unit 5 supports the poultry 1 at the legs 6, as is shown in figure 2. Further, as will be explained hereinafter with reference to figures 6 - 9, at least this movable takeover unit 7 of the system is movable independent from the leg positioning unit 5 towards a second shackle 4 of the second shackle conveyor in order to move the legs 6 of the poultry 1 into such second

shackle 4 of the second shackle conveyor.

**[0031]** Before the motion of the previous paragraph is executed the movable takeover unit 7 is arranged to engage the legs 6 of the poultry 1 in an upward movement of the takeover unit 7 ending adjacent to where the leg positioning unit 5 engages the legs 6 of the poultry 1. For best results the leg positioning unit 5 and/or the movable take-over unit 7 engage the legs 6 at or near the ankle at the ankle's front side, preferably above the ankle at a drum side of the legs 6, which is most clearly shown in figure 3A. Preferably the movable takeover unit 7 is engaging the legs 6 at a position which is more distant from the first shackle 3 where the poultry 1 is suspended by the head 2, than the distance of the leg positioning unit 5 to the first shackle 3 when said leg positioning unit 5 is engaging the legs 6 of the poultry 1.

**[0032]** With reference to figure 3B it is shown that the movable takeover unit 7 is provided with slits 9 for receiving the legs 6 of the poultry 1. Figure 3B further shows that the movable takeover unit 7 is provided with restricting elements 10 for preventing removal of the legs 6 from the first slits 9 after the movable takeover unit 7 has engaged the legs 6 of the poultry 1 and received the legs 6 in the slits 9. These restricting elements 10 are activated to prevent removal of the legs 6 from the first slits 9 before the moment that the first shackle 3 from which the poultry 1 is suspended by the head 2 releases the head 2, causing the poultry 1 to flip over and become suspended by the legs 6 only from the movable take-over unit 7. This is depicted in figure 5.

**[0033]** From then on the movable takeover unit 7 is arranged to move the legs 6 of the poultry 1 towards the second shackle 4 of the second shackle conveyor in a preferably essentially horizontal motion, which is illustrated by comparing the sequence of figures 5 - 7. Figure 6 depicts that the movable takeover unit 7 has approached the second shackle 4, wherein in the situation of figure 6 the feet of the legs 6 have reached a point lying above the second shackle 4. As is common for shackles for suspending poultry 1 by the legs 6, the second shackle 4 is provided with essentially vertical slits 11 for receiving and retaining the legs 6 of the poultry 1; this will hereinafter be further illustrated with reference to figures 10 and 11.

**[0034]** By comparing figure 6 and figure 7 it is shown that the movable takeover unit 7 is arranged to move downwards after the feet of the legs 6 have reached a point lying above the second shackle 4, as depicted in figure 6 wherein the movable takeover unit 7 has moved the legs 6 of the poultry 1 closely near to and above the second shackle 4 of the second shackle conveyor. With the subsequent downward movement of the movable takeover unit 7, the legs 6 of the poultry 1 are moved down such that the feet with the toes engage an upper bar 18 of the second shackle 4, prior to moving the toes to get into said second shackle 4 as depicted in figure 7. A comparison of figure 7 and 8 shows that once the toes of the feet are placed into the second shackle 4, the movable takeover unit 7 moves the legs 6 further into the second shackle 4 in a continued downward movement for retainment of the legs 6 down into said essentially vertical slits 11 of the second shackle 4. Figure 9 finally illustrates the movable takeover unit 7 immediately prior to the removal of the movable takeover unit 7, after which the poultry 1 will be entirely suspended by the legs 6 from the second shackle 4 of the second



shackle conveyor.

**[0035]** It is possible to use a conventional shackle 4 as shown in figure 10 in the above explained exemplary rehanging method. Such a conventional shackle 4 comprises a central vertical bar 12, wherein on a lower end 12' of said central vertical bar 12 and connected to said central vertical bar 12, two first rods 13, 14 diverge away from each other and connect to a lower horizontal rod 15 distant from the central bar 12, wherein on opposite ends of the lower horizontal rod 15, said horizontal rod 15 bends into two upwardly extending second rods 16, 17 that eventually connect to the central vertical bar 12, and wherein the two first rods 13, 14 and the two second rods 16, 17 delimit and define slits 11 between the two first rods 13, 14 and the two second rods 16, 17 for receiving and retaining the legs 6 of poultry 1 suspended by the legs 6 from this second shackle 4.

**[0036]** Advantageously a shackle according to the design as shown in figure 11 is used. The shackle according to figure 11 has the same features as the conventional shackle 4 which is shown in figure 10, but has the additional and differentiating feature that the two upwardly extending second rods 16, 17 merge into an upper horizontal rod 18 distant from the lower horizontal rod 15, which upper horizontal rod 18 is fixed in position at a predetermined distance from the central vertical bar 12. For this purpose the upper horizontal rod 18 is connected to the central vertical bar 12 with an intermediate connection piece 19. With the second shackle 4 of figure 11 it is easier to move the legs 6 of the poultry 1 down into the slits 11 of the second shackle 4 after the feet of the legs 6 have reached a point lying above the second shackle 4, as depicted in figure 6, in a single downward movement.

**[0037]** Embodiments of the present invention can include every combination of features that are disclosed herein independently from each other. Although the invention has been discussed in the foregoing with reference to an exemplary embodiment of the system 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.

**[0038]** Variations and modifications of the present invention will be obvious to those skilled in the art and it is intended to cover in the appended claims all such modifications and equivalents. One such possible variation or modification is depicted in figures 12 - 14, which in addition to the embodiment of figures 1 - 3 also show a breast support 20 for the poultry 1. The figures 12 - 14 shows several subsequent stages of movement of the leg positioning unit 5 and the movable takeover unit 7, wherein also the breast support 20 assumes different positions to assist in supporting the poultry 1 during the rehanging operation.

# REFERENCES CITED IN THE DESCRIPTION

## Cited references

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## Patent documents cited in the description

- [WO2014026695A \[0002\] \[0004\]](#)
- [WO0041568A \[0003\] \[0004\]](#)

## Patentkrav

1. System til omhængning af fjerkræ (1), som er ophængt i hovedet (2) i en første bøjle (3) på en første bøjletransportør til en anden bøjle (4) på en anden bøjletransportør, hvor fjerkræet (1) er eller vil blive ophængt i benene (6), hvor systemet omfatter en benpositioneringsenhed (5), der er indrettet til at understøtte fjerkræet (1) ved benene (6), mens fjerkræet (1) holdes ophængt i hovedet (2) i den første bøjle (3) på den første bøjletransportør, og hvor systemet omfatter en bevægelig overtagelsesenhed (7), der kan bevæges mod den anden bøjle (4) på den anden bøjletransportør for at flagette fjerkræets (1) ben (6) ind i den anden bøjle (4) på den anden bøjletransportør, hvor den bevægelige overtagelsesenhed (7) er indrettet til at fungere i det mindste, når benpositioneringsenheden (5) understøtter fjerkræet (1) ved benene (6), **kendetegnet ved** at den bevægelige overtagelsesenhed (7), uafhængigt og adskilt fra benpositioneringsenheden (5), bevæger sig mod den anden bøjle (4) på den anden bøjletransportør og er indrettet til at virke direkte på fjerkræets (1) ben (6) for at flytte fjerkræets (1) ben (6) ind i den anden bøjle (4) på den anden bøjletransportør.
2. System ifølge krav 1, **kendetegnet ved** at benpositioneringsenheden (5) omfatter en krog (5'), der er indrettet til at gå i indgreb med fjerkræets (1) ben (6), mens det er ophængt i hovedet (2).
3. System ifølge krav 2, **kendetegnet ved** at krogen (5') på benpositioneringsenheden (5) er indrettet til at følge en i det væsentlige cirkulær bane ved at nærme sig benene (6) for til sidst at gå i indgreb med fjerkræets (1) ben (6), idet den cirkulære bane ender i en position, hvor fjerkræets (1) ben (6) strækker sig skråt eller sidelæns væk fra det sted, hvor fjerkræet (1) er ophængt i hovedet (2).
4. System ifølge et hvilket som helst af kravene 1-3, **kendetegnet ved** at den bevægelige overtagelsesenhed (7) er indrettet til at gå i indgreb med fjerkræets (1) ben (6) i en opadgående bevægelse af overtagelsesenheden (7), der ender ved siden af det sted, hvor benpositioneringsenheden (5) går i indgreb med benene (6) på fjerkræet (1).
5. System ifølge et hvilket som helst af kravene 1-4, **kendetegnet ved** at benpositioneringsenheden (5) og/eller den bevægelige overtagelsesenhed (7) går i indgreb med fjerkræets (1) ben (6) ved eller nær anklen ved anklen forside.
6. System ifølge krav 4 eller 5, **kendetegnet ved** at den bevægelige overtagelsesenhed (7) går i indgreb med benene (6) i en position, som er længere væk fra den første bøjle (3), hvor fjerkræet (1) er ophængt i hovedet (2), end afstanden fra benpositioneringsenheden (5) til den første bøjle (3), når benpositioneringsenheden (5) går i indgreb med benene (6) på fjerkræet (1).
7. System ifølge et hvilket som helst af kravene 1-6, **kendetegnet ved** at den bevægelige overtagelsesenhed (7) er forsynet med første spalter (9) til at modtage fjerkræets (1) ben (6).
8. System ifølge krav 7, **kendetegnet ved** at den bevægelige overtagelsesenhed (7) er forsynet med restriktionselementer (10), der forhindrer, at benene (6) fjernes fra de første spalter (9).

9. System ifølge et hvilket som helst af kravene 1-8, **kendetegnet ved** at systemet er indrettet til at frigøre hovedet (2) fra den første bøjle (3), efter den bevægelige overtagelsesenhed (7) er gået i indgreb med fjerkræets (1) ben (6).

10. System ifølge krav 8 og 9, **kendetegnet ved** at systemet er indrettet til at frigøre hovedet (2) fra den første bøjle (3), efter at restriktionselementerne (10) af den bevægelige overtagelsesenhed (7) er aktiveret for at forhindre fjernelse af benene (6) fra de første spalter (9), hvori fjerkræets (1) ben (6) er modtaget.

11. System ifølge et hvilket som helst af kravene 1-10, **kendetegnet ved** at den bevægelige overtagelsesenhed (7) er indrettet til at bevæge fjerkræets (1) ben (6) mod den anden bøjle (4) på den anden bøjletransportør i en i det væsentlige vandret bevægelse.

12. System ifølge et hvilket som helst af kravene 1-11, der endvidere omfatter den anden bøjletransportør med den anden bøjle (4), hvori fjerkræet (1) hænger eller vil blive ophængt i benene (6), **kendetegnet ved** at den anden bøjle (4) er forsynet med i det væsentlige andre lodrette spalter (11) til at modtage og fastholde benene (6) på fjerkræet (1), hvor den bevægelige overtagelsesenhed (7) er indrettet til at bevæge sig i nedadgående retning, efter at den bevægelige overtagelsesenhed (7) med fjerkræets (1) ben (6) er blevet flyttet mod den anden bøjletransportørs anden bøjle (4) for at flytte benene (6), således at de fastholdes nede i de i det væsentlige anden lodrette spalter (11) på den anden bøjle (4).

13. System ifølge krav 11 eller 12, hvor den anden bøjle (4) omfatter en øvre vandret stang (18) placeret i en afstand fra og over de andre spalter (11), **kendetegnet ved** at den bevægelige overtagelsesenhed (7) er indrettet til at flytte fødderne, der strækker sig fra benene (6) over og forbi den øvre vandrette stang (18), og derefter at flytte benene (6) nedad, således at fødderne kommer i kontakt med den øvre vandrette stang (18), og tærne på fødderne flyttes ind i den anden bøjle (4) før benene flyttes (6) ind i de i det væsentlige anden lodrette spalter (11) på den anden bøjle (4).

14. System ifølge krav 13, **kendetegnet ved** at den bevægelige overtagelsesenhed (7) er indrettet til at flytte benene (6) i en nedadgående bevægelse ind i de anden spalter (11), når tærne er anbragt i den anden bøjle (4).

15. System ifølge et hvilket som helst af kravene 13-14, **kendetegnet ved** at den anden bøjle (4) omfatter en central lodret stang (12) på en nedre ende (12') af den centrale lodrette stang (12) og forbundet til den centrale lodrette stang (12), to første stænger (13, 14) divergerer væk fra hinanden og forbindes med en nedre vandret stang (15) anbragt i en afstand fra den centrale stang (12), hvor den vandrette stang (15), i modsatte ender af den nedre vandrette stang (15), bøjer sig ind i to anden stænger (16, 17), som bøjer opad, og som til sidst forbinder til den centrale lodrette stang (12), og hvor de to første stænger (13, 14) og de to anden stænger (16, 17) afgrænser og definerer spalter (11) mellem de to første stænger (13, 14) og de to anden stænger (16, 17) med henblik på at modtage og fastholde benene (6) på fjerkræet (1), der er ophængt i benene fra den anden bøjle (4), hvor de to andre stænger (16, 17), som bøjer opad, løber sammen i den øvre vandrette stang (18), der er anbragt på afstand fra den nedre vandrette stang (15), hvilken øvre vandrette stang (18) er fast anbragt i en forudbestemt afstand fra den centrale lodrette stang (12).

16. System ifølge et hvilket som helst af kravene 1-15, **kendetegnet ved** at systemet omfatter en bryststøtte (20) til at understøtte fjerkræet (1), før benpositioneringsenheden (5) understøtter fjerkræet (1) ved benene (6).

# DRAWINGS

Drawing

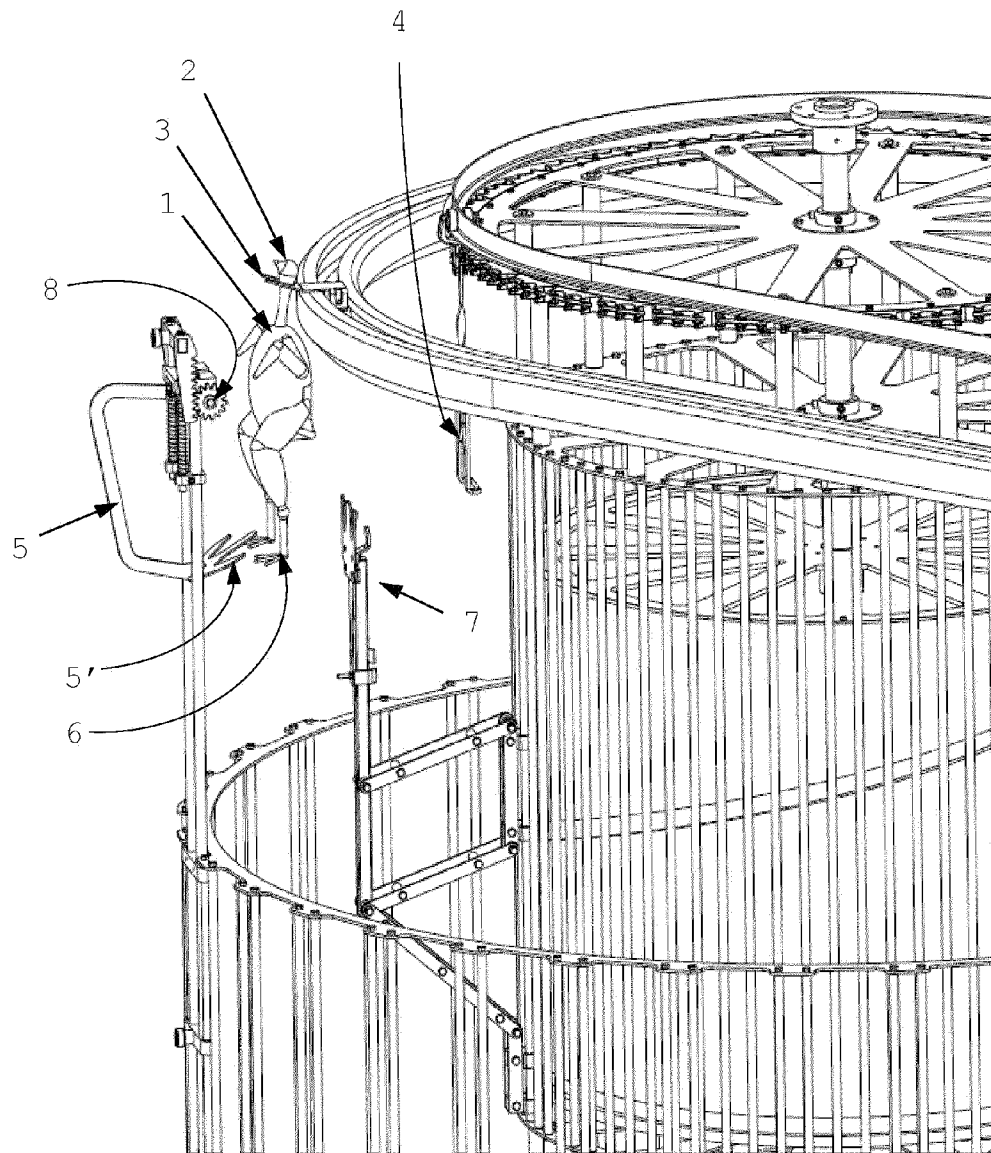


Fig.1

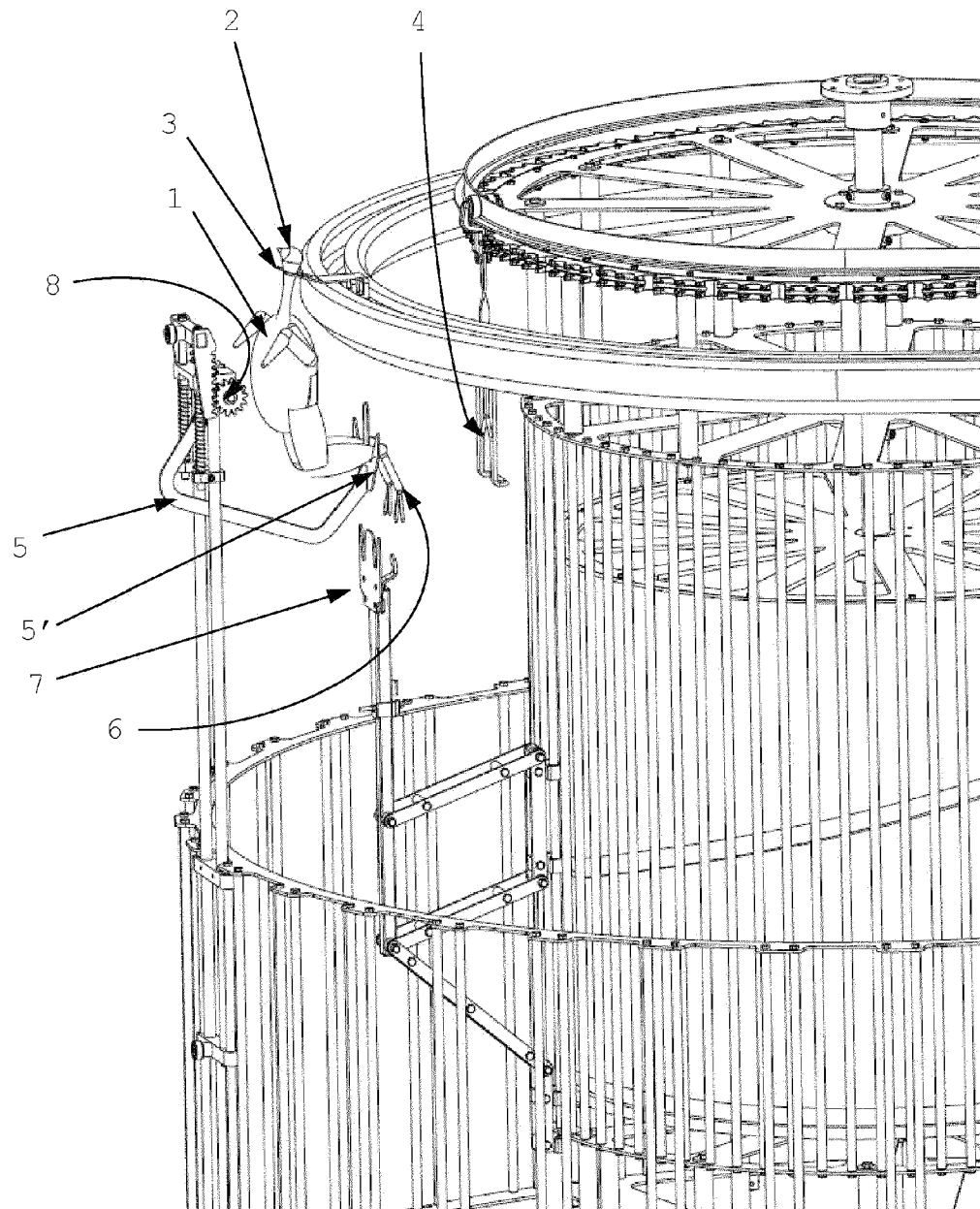
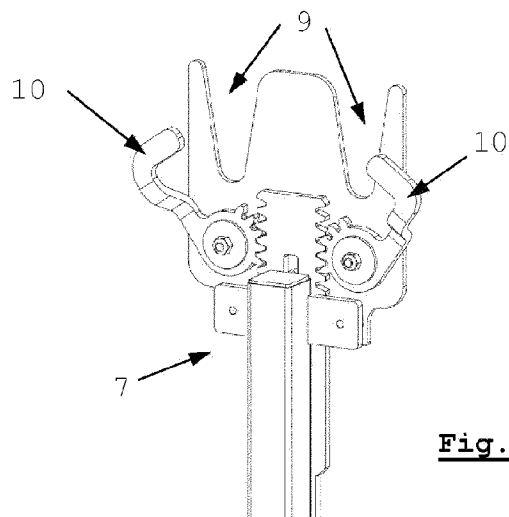
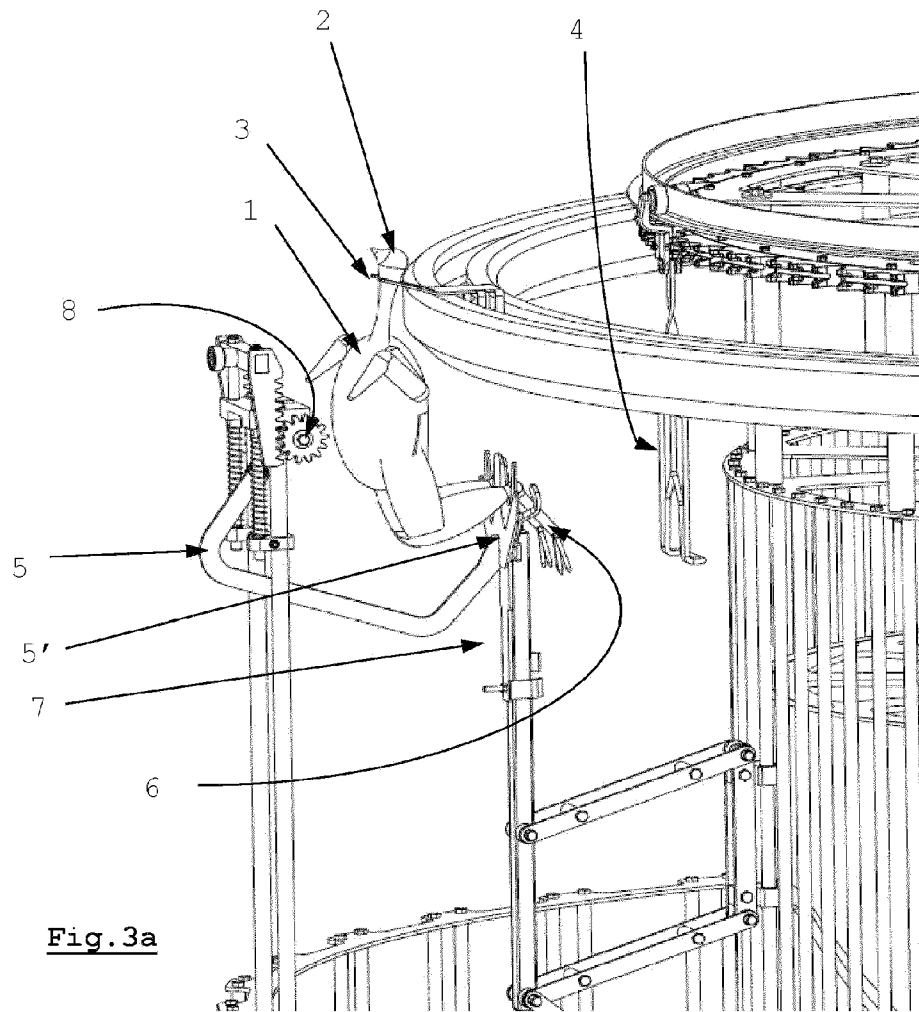


Fig.2





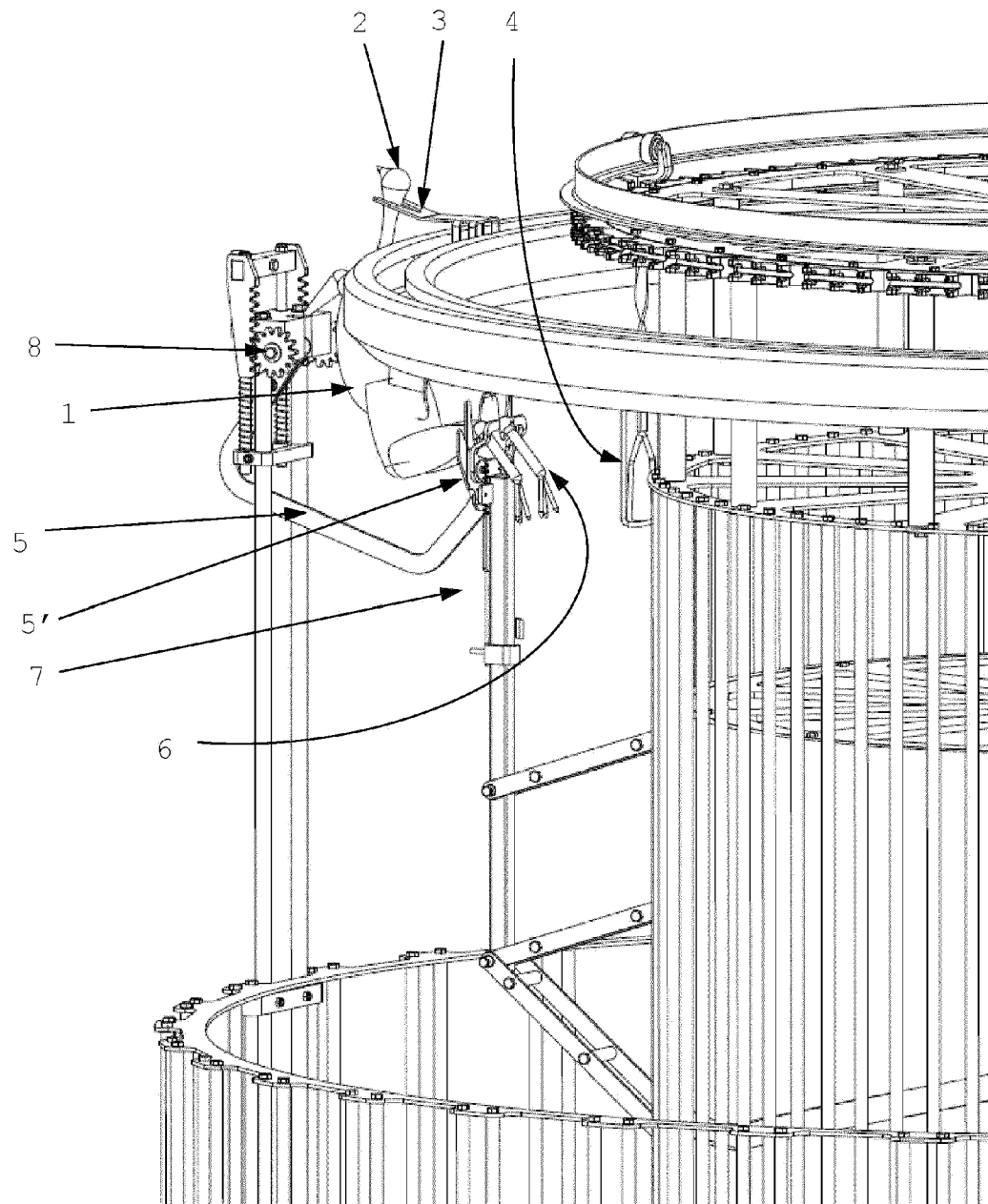


Fig.4

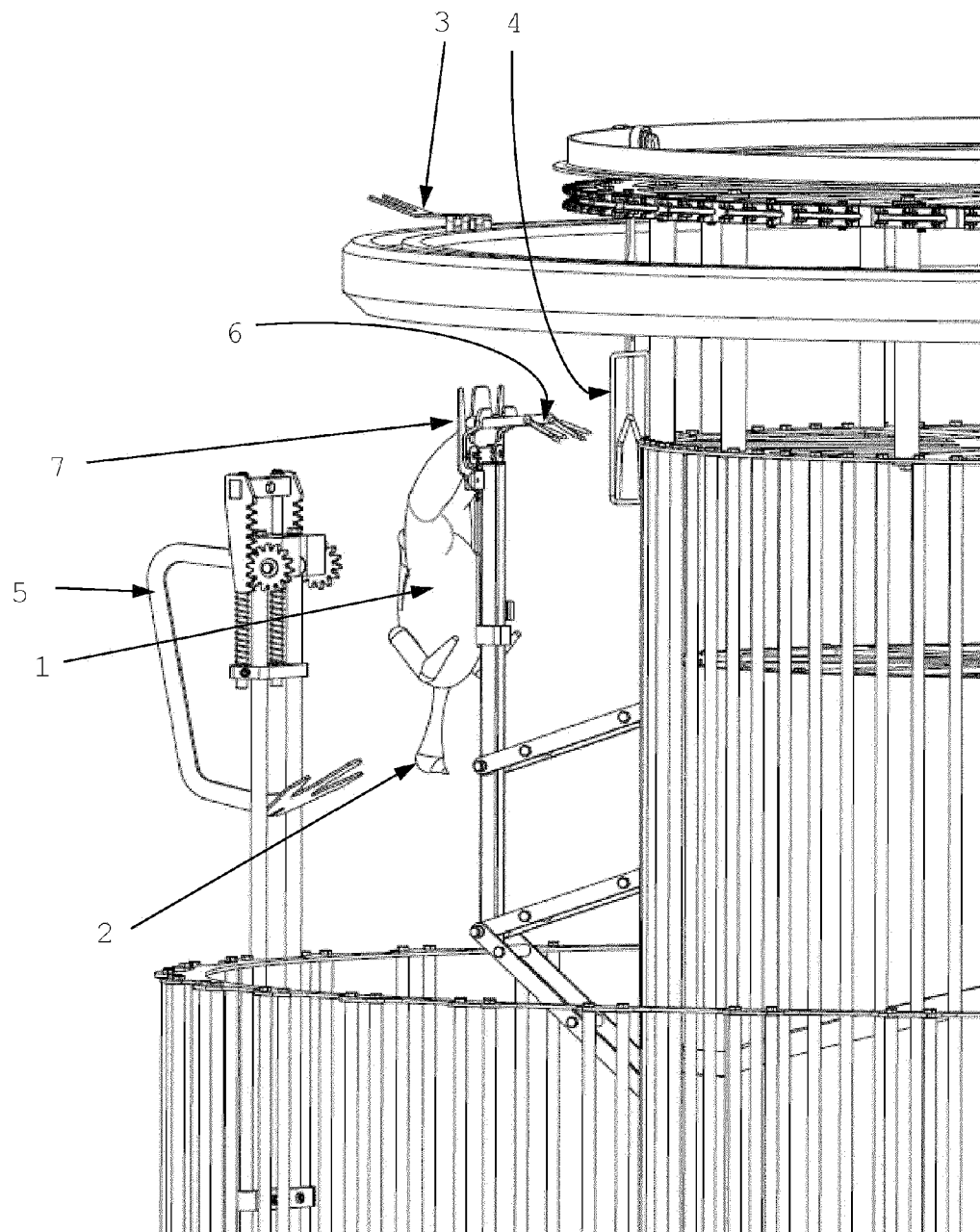
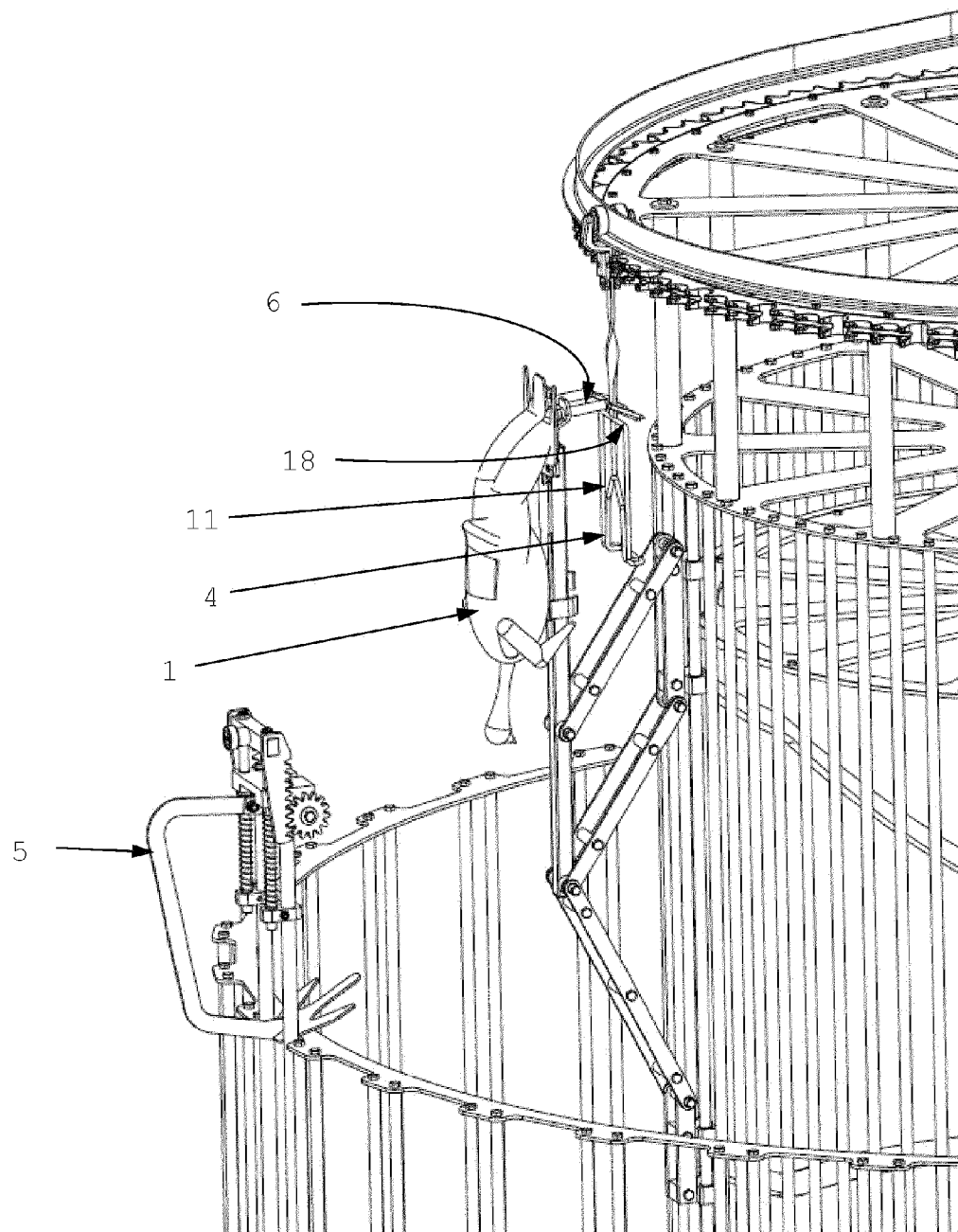
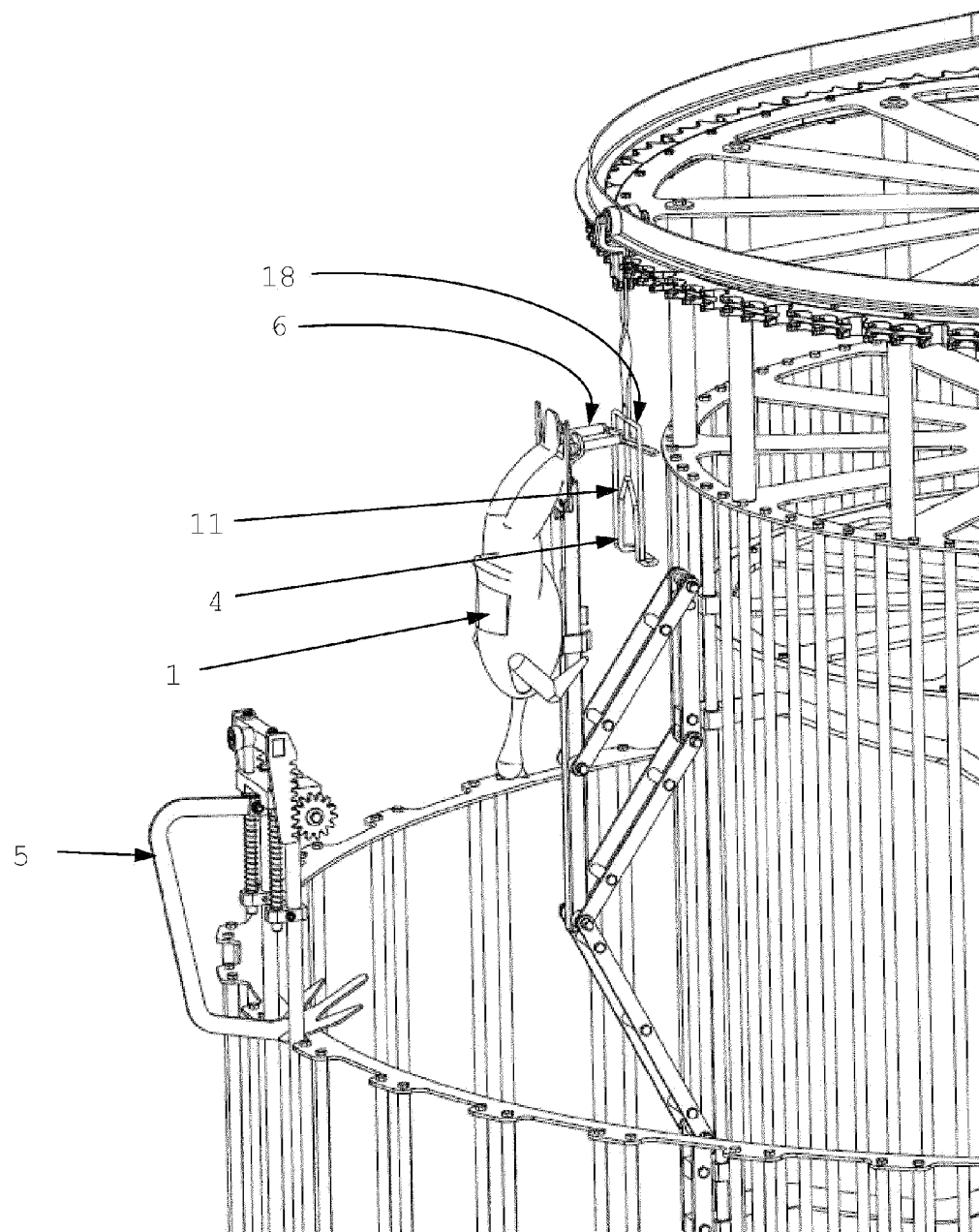


Fig.5



**Fig. 6**



**Fig. 7**

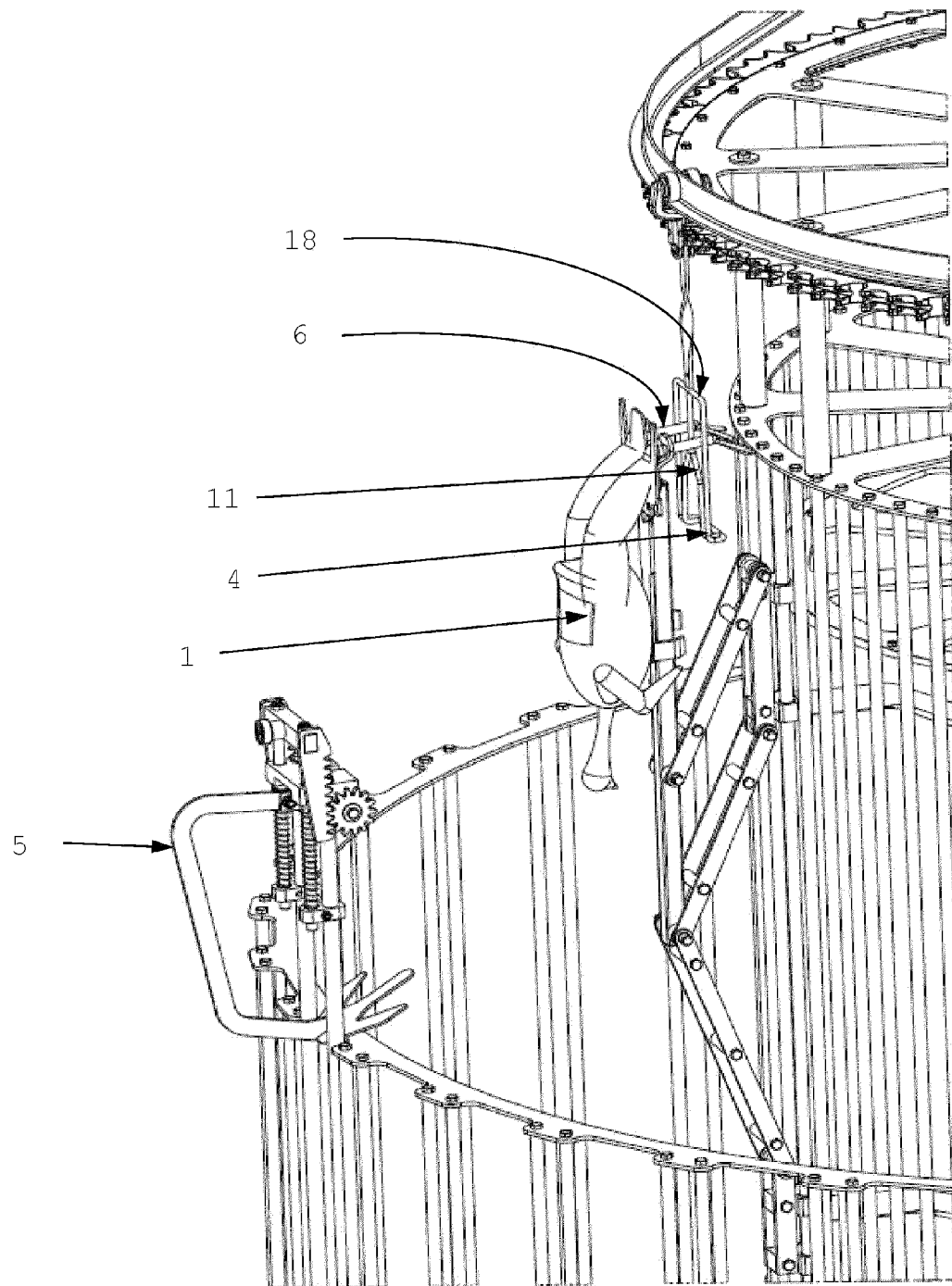


Fig. 8

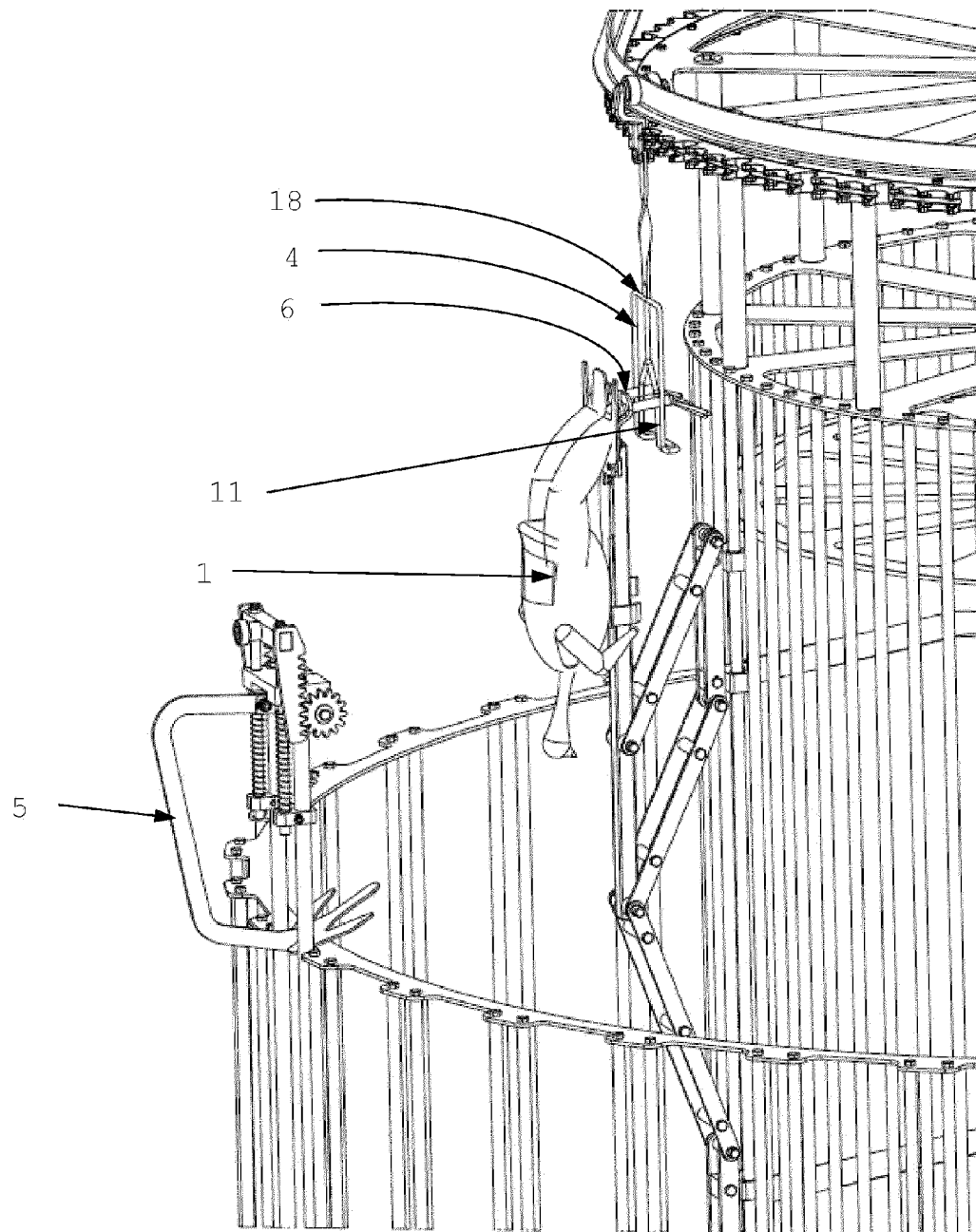


Fig.9

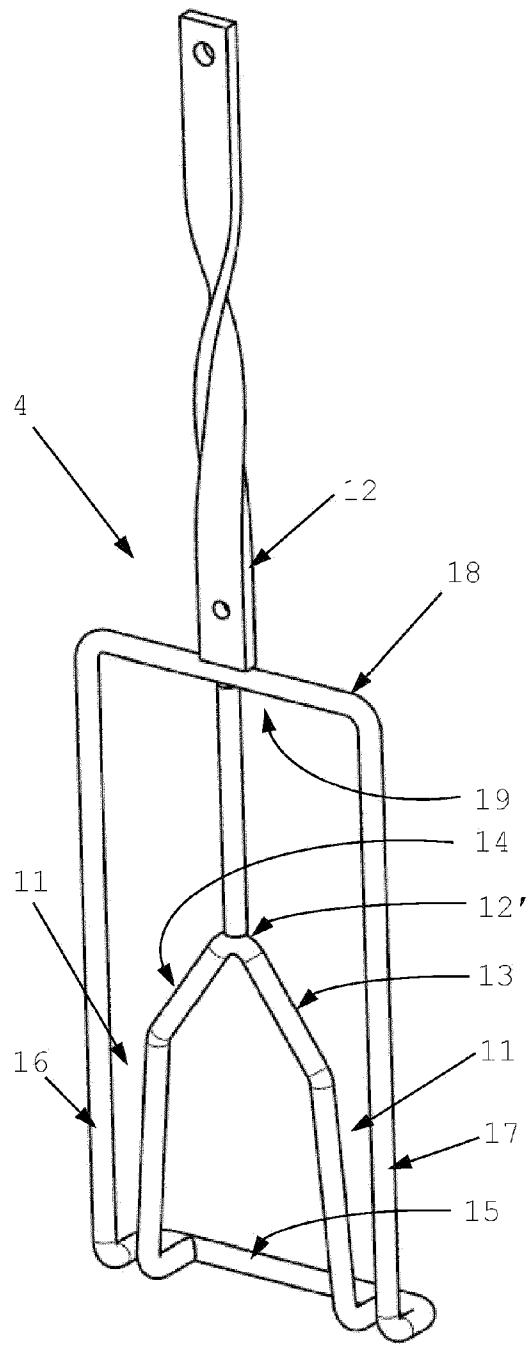


Fig. 10

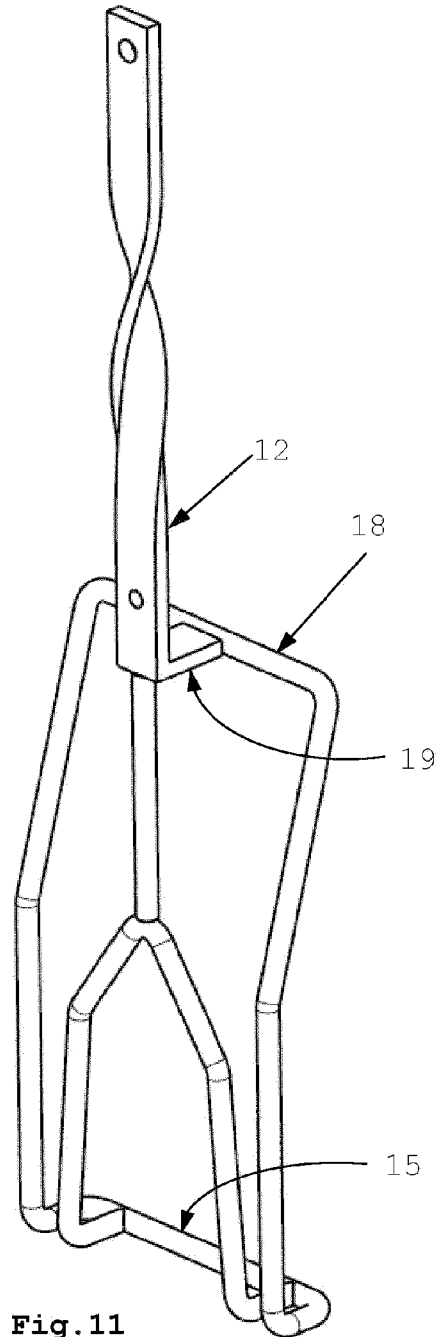


Fig. 11

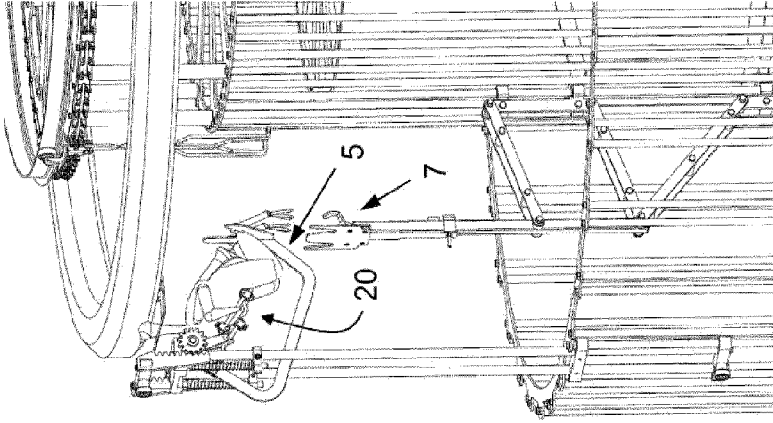


Fig. 14

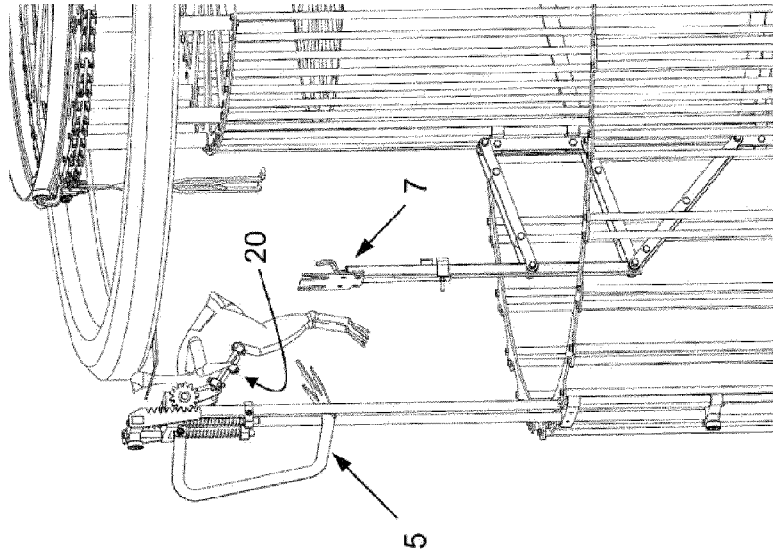


Fig. 13

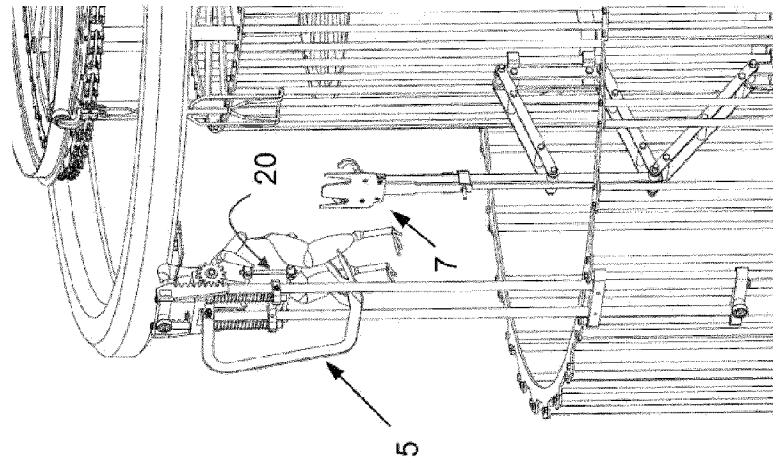


Fig. 12