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(54) **Feeding device for wrapping machines for confectionery products**

Zufuhrvorrichtung für Wickelmaschinen für Süßwaren

Dispositif d'alimentation pour des machines à emballer des produits de confiserie

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Description

Technical Field

[0001] The present invention concerns a feeding device for wrapping machines for confectionery products and the like.

Background Art

[0002] It has been known that machines that provide an automatic wrapping of confectionery products are currently used. Known wrapping machines generally provide that the products to be wrapped be fed individually, one after another, along a feeding line, shaped for example by a conveyor belt. The single products are fed in support on the conveyor belt to an exit zone of the feeding line, at which suitable transfer means operate for bringing the products to a wrapping head. The cited transfer means are made up for example of lift means which provide to grasp the single products together with a respective wrapping sheet, suitably fed above the exit zone of the feeding line.

[0003] The wrapping head is provided with a series of grip members for the single product, angularly distributed about a horizontal rotation axis, and is suitable to be operated in rotation at pitch, to bring the products with the wrapping sheets at a series of working stations, in which occur respectively the wrapping of the wrapping sheet about the same product, the closure of the wrapping and the release of the wrapped products.

[0004] More specifically, wrapping machines are known in which the feeding line of the products is arranged frontally to the wrapping zone and in particular it results perpendicular to the vertical rotation plane of the wrapping head. Such frontal arrangement is anyway less convenient, because of the considerable space which it needs in the machine. It would be better to feed the products to be wrapped according to a direction arranged longitudinally in line with the wrapping head, to free, as much as it is possible, the front zone of the machine. The feeding in line of the products is not currently carried out in an easy and efficient way because of the functional requirements of the different working members which work in the transfer zone for the product to the wrapping head.

[0005] For example, patent application EP0733548 discloses a wrapping machine comprising two wrapping heads which allow a suitable orientation of the single products. Anyway, such machine has complicated elements which are bulky and can be inappropriate for a high speed functioning.

[0006] A problem complained in the specific field is that of controlling the orientation of the products during the transferring to the wrapping head. In particular, it is generally required that the products arrive to the wrapping head with the longitudinal axis parallel to the rotation axis of the wrapping head.

[0007] Patent application DE10138943 discloses a transfer device for food products comprising a plurality of pliers devices, each having a respective longitudinal axis and being mobile between a feeding and entry station of a series of products at which it grasps a product, and a load station of said product to a wrapping device. The pliers device comprises a first and a second jaw, mobile by means of respective command means between an open position and a closed position in which they grasp the product at two sides. One of said jaws comprises respective stopping means suitable to shape a position of the same jaw with respect to said longitudinal axis independently from the closure position reached by the other jaw.

[0008] Anyway, also such device has a considerable constructive and functional complexity and needs a large space.

Disclosure

[0009] The task of the present invention is that of solving the above mentioned problems providing a device which allows to feed in an optimal way the products to the wrapping head of wrapping machines for confectionery products and the like, in particular allowing to control the orientation of the products in the transfer step to the wrapping head.

[0010] Within such task, it is a further scope of the present invention that of providing a device with reduced size.

[0011] A further scope of the present invention is that of providing a device of simple constructive and functional conception, versatile use, as well as relative economic costs.

[0012] The cited scopes are attained, according to the present invention, by the feeding device for wrapping machines for confectionery products according to claim 1.

[0013] According to the invention, the feeding device comprises a transfer and orientation unit for the products to be wrapped comprising a tilting arm operated in alternated motion on a vertical plane longitudinal to a feeding direction of said products and provided with a grip member for single products having substantially the shape of pliers, and kinematic means suitable to command the angular rotation of the grip means for performing, simultaneously, the tilting motion of said arm of the transfer and orientation member, and the shifting of said products to be wrapped on a vertical plane parallel to said plane longitudinal to the feeding line.

[0014] Preferably, said grip means is provided with a couple of levers carrying respective jaws of said pliers, said levers being pivoted on said tilting arm according to a same rotation axis defined by a pivot pin.

[0015] Preferably, said levers of the grip means are pivoted on said tilting arm according to a rotation axis laying on a plane perpendicular to the rotation axis of the same tilting axis.

[0016] Preferably, said kinematic means are suitable

to command an angular rotation of the grip means of 90° during the shifting step of said products to be wrapped on a vertical plane parallel to said plane longitudinal to the feeding line.

[0017] Preferably, said kinematic means comprise a couple of rocker arm levers rotatable according to a same rotation axis perpendicular to said vertical plane longitudinal to the feeding line and articulated respectively to said levers of the grip means through relative tie elements.

[0018] Preferably, said rocker arm levers are operated in independent way by respective cam means.

[0019] Preferably, said tie elements are pivoted to said rocker arm levers and to said levers of the grip means through respective spherical junction members.

[0020] Preferably, said levers of the grip member are pivoted each on a prong of a fork shaped by said tilting arm.

[0021] Preferably, said jaws are mounted in interchangeable way on respective levers of the grip means.

Description of Drawings

[0022] Details of the invention shall be more apparent from the detailed description of a preferred embodiment of the feeding device for wrapping machines for confectionery products illustrated for indicative purposes in the attached drawings, wherein:

figure 1 shows a front view of the feeding device according to the invention;
 figures 2 and 3 show a perspective view of a transfer unit of the feeding device according to the invention according to different working steps;
 figures 4 and 5 respectively show a front and a plant view of the said transfer unit. Best Mode

[0023] With particular reference to such figures, the feeding device for wrapping machines for confectionery products has been indicated in its entirety with 1. The device 1 is suitable to pick up the products coming from a feeding line 2 and to transfer them to a wrapping head 3 of the wrapping machine. The feeding line 2 is made up for example of a conveyor belt on which the confectionery products, for simplicity not represented, are fed in succession in support on a flat lower face. The feeding line can be anyway be made up of transport means having a different shape, in particular provided by suitable separation means for the products, provided with containment seats for the product or with separation means for the same products, in a manner known per se.

[0024] At the exit from the conveyor belt of the feeding line 2, a support member 4 is arranged, attached to the framework of the wrapping machine and suitable to be an extension of the same feeding line. A stopping member 5 cooperates with the support member 4 and is suitable to hold the single products in a pre-established position, substantially corresponding with a picking position

by means of the feeding device 1. The stopping member 5 is carried protruding frontally to the feeding line 2 by means of a lever 6 tilting about a pivot 7. The pivot 7 is arranged with its axis perpendicular to the longitudinal median plane of the feeding line 2.

[0025] The feeding device 1 comprises a transfer and orientation unit 10 which is suitable to pick the products fed to the above mentioned picking position and to transfer them suitably oriented to a release zone, at which the same products are to be reached by a relative wrapping sheet.

[0026] The transfer and orientation unit 10 comprises a tilting arm 11 which is rotatable according to a rotation axis perpendicular to the vertical plane longitudinal to the feeding line 2; the tilting arm 11 is operated by suitable cam means, not represented, which receive the motion through a relative shaft 20. The tilting arm 11 shapes, at its free end, a fork 12 carrying a grip member 13 for the product to be transferred, having substantially pliers shape. More in particular, such grip member 13 is made up of a couple of levers 14, 15 pivoted each on a prong of said fork 12 of the tilting arm 11, according to a same rotation axis defined by a pivoting pin 16. The levers 14, 15 bear respective opposite fixed jaws 17, 18, suitable to grasp the product to be transferred. The jaws 17, 18 are suitably mounted in an interchangeable way on the respective levers 14, 15 according to the type and the size of the product to be transferred. In practice, each jaw shapes an abutment surface suitable to abut laterally a respective portion of the product, in a closure configuration.

[0027] The levers 14, 15 are connected to the free end of a respective rocker arm lever 21, 22 through respective tie elements 19, only one of which is represented in the figures; the tie elements 19 are pivoted to the levers 14, 15 and to the rocker arms 21, 22 through respective junction members 23. The rocker arms 21, 22 are supported rotatable according to a same rotation axis perpendicular to the vertical plane longitudinal to the feeding line 2, that is, parallel to the rotation axis of the tilting arm 11. The rocker arms 21, 22 are operated in independent manner by respective cam means.

[0028] Downstream of the transfer and orientation unit 10, the feeding device has a lift unit 30, suitable to receive the products from the above mentioned transfer and orientation unit 10 and to transfer them to the wrapping head 3. The lift unit 30 comprises, in known manner, a lift 31 and a counter-lift 32, carried at the ends of respective radial arms 33, 34 which are operated in tilting manner according to a rotation axis perpendicular to the vertical plane longitudinal to the feeding line 2.

[0029] The functioning of the feeding device for machines for wrapping confectionery products is described in the following.

[0030] The products to be wrapped are fed in line on the conveyor belt of the feeding line 2. At the end of such feeding line, each single product is brought on the support member 4, against the stopping member 5.

[0031] The transfer and orientation member 10 is in such step prearranged with the jaws 17, 18 of the grip member 13 in open configuration in the picking position (see in particular figure 2).

[0032] Subsequently, the closure of the jaws 17, 18 of the grip means 13 is operated through the angular rotation of the levers 14, 15. In such way, is carried out the grip of a single product prearranged in the picking position on the support member 4. Obviously, it is possible to provide that the product to be wrapped be arranged in the picking position by the grip member 13 through members of different type, such as for example an overturn member for the same product.

[0033] Subsequently, the tilting of the arm 11 which carries the grip member 13 is operated, to transfer the product gripped between the jaws 17, 18 from the picked up position to a release position in which the same product is held between the lift 31 and the counter-lift 32 of the lift unit 30.

[0034] At the same time, the rocker arms 21, 22 operate the rotation in the same direction of the levers 14, 15 of the grip unit 13, to cause a corresponding angular rotation of the jaws 17, 18 which carry the product to be wrapped (see figure 3). Suitably, such angular rotation extends for an arc of 90°. In such way, the product to be wrapped reaches the release position being shifted on a vertical plane parallel to the picking plane, outgoing from the feeding line 2.

[0035] Once arrived at the release zone, the product is wrapped at the top by the wrapping sheet. The actuation means bring then the jaws 17, 18 of the grip member 13 in the open position to release the product so covered. At the same time, the lift means 30 grasp, in known way, the product together with the wrapping sheet and bring it to the wrapping head 3. In particular, the wrapping head 3 is suitable to receive the product to complete the wrapping operations.

[0036] While the lift means 30 move the product towards the wrapping head 3, the transfer member 10 performs the return motion from the release zone to the picking up zone. During such return motion, the jaws 17, 18 of the grip member 13 are kept in the open position prepared for performing the next picking.

[0037] In the meantime, a new product arrives at the support member 4. Next, a new picking, transfer and release cycle can subsequently start, according to the preceding description.

[0038] Therefore, the device according to the invention attains the scope of performing in simple and efficient way the feeding of confectionery products and the like, furthermore allowing the control of the orientation of the same products during their transfer from the picking zone to the release zone. This is due essentially to the presence of the transfer and orientation unit suitable to tilt on the vertical plane parallel to the plane of the wrapping head and simultaneously to turn the orientation of the products gripped by the jaws associated with the tilting arm of the above mentioned transfer and orientation

member.

[0039] Therefore, the transfer and orientation member according to the invention allows to perform in an optimal way the transfer and the rotation of the products, thus totally preventing to obstruct the front zone of the wrapping machine.

[0040] A feature of the invention consists in the fact that the transfer and orientation member allows to transfer and to turn the products to be wrapped from the picking zone to a release zone suitably spaced, at which the lift means operate to feed the same products to the wrapping head of the machine. This allows to free a suitable space under the wrapping head, between the picking zone and the release zone, to allow an optimal housing of the feeding means for the wrapping sheet and to prevent the storage of different working members of the machine. The result is a more ergonomic displacement of such working member, which results to be easier to reach for the possible maintenance operations.

[0041] Moreover, the transfer cycle carried out by the transfer and orientation unit can be easily adjusted to result exactly in step with the feeding operations for the products. In particular, the time required by the transfer and orientation unit for completing a transfer cycle can be optimized according to the time required to divide and arrange a new product on the picking position.

[0042] It is to be observed that the kinematic means and the actuation means of the transfer and orientation unit can obviously be made in shapes different from the one described as an example, for example by using suitable gears, belts and the like.

[0043] Finally, it is to be observed that the device according to the invention can obviously be shaped and used for any type confectionery product, in particular of any shape and size.

[0044] A further advantage of the device according to the invention is made by the constructive compactness which allows, in a very reduced space, to house the members provided for the transfer and for the kinematic control of the product up to the wrapping head.

[0045] In practice, the embodiment of the invention, the materials used, as well as the shape and dimensions, may vary depending on the requirements.

[0046] Should the technical characteristics mentioned in each claim be followed by reference signs, such reference signs were included strictly with the aim of enhancing the understanding the claims and hence they shall not be deemed restrictive in any manner whatsoever on the scope of each element identified for exemplifying purposes by such reference signs.

Claims

1. Feeding device for wrapping machines for confectionery products, **characterized in that** it comprises a transfer and orientation unit (10) comprising a tilting arm (11) operated in alternated motion on a vertical

plane longitudinal to a feeding line (2), suitable to transport an ordered series of confectionery products to be wrapped until a picking zone, for transferring single products from said picking zone to a spaced release zone in which lift means (30) are suitable to operate for the transport of a product to be wrapped to a wrapping head (3);

a grip member (13) for said single products to be transferred, having substantially the shape of pliers, carried by said tilting arm (11) and provided with a couple of levers (14, 15) carrying respective jaws (17, 18) of said pliers, said levers (14, 15) being pivoted on said tilting arm (11) according to a same rotation axis defined by a pivot pin (16), said jaws (17, 18) being operable to close through the angular rotation of the said levers (14, 15); kinematic means (21, 22) suitable to command the angular rotation in the same direction of said levers (14, 15) of the grip member (13), so as to cause a corresponding angular rotation of the said jaws (17, 18) for performing, simultaneously with the tilting motion of said arm (11) of the transfer and orientation member (10), the shifting of said products to be wrapped on a plane vertical and parallel to said plane longitudinal to the feeding line (2).

2. Device according to claim 1, **characterized in that** said levers (14, 15) of the grip member (13) are pivoted on said tilting arm (11) according to a rotation axis laying on a plane perpendicular to the rotation axis of the same tilting arm (11).
3. Device according to claim 1 or 2, **characterized in that** said kinematic means comprise a couple of rocker arm levers (21, 22) rotatable according to a same rotation axis perpendicular to said vertical plane longitudinal to the feeding line (2) and articulated respectively to said levers (14, 15) of the grip member (13) through relative tie elements (19).
4. Device according to claim 3, **characterized in that** said rocker arm levers (21, 22) are operated in independent way by respective cam means.
5. Device according to claim 3, **characterized in that** said tie elements (19) are pivoted to said rocker arm levers (21, 22) and to said levers (14, 15) of the grip member (13) through respective spherical junction members (23).
6. Device according to claim 2 or 3, **characterized in that** said levers (14, 15) of the grip member (13) are pivoted each on a prong of a fork (12) shaped by said tilting arm (11).
7. Device according to claim 6, **characterized in that** said jaws (17, 18) are mounted in interchangeable way on said respective levers (14, 15) of the grip

member (13).

8. Machine for wrapping confectionery products comprising a feeding device according to one of the previous claims.

Patentansprüche

1. Zuführvorrichtung für Einwickelmaschinen von Süßwaren, **dadurch gekennzeichnet, dass** sie umfasst:

eine Übertragungs- und Ausrichtungseinheit (10), die einen mit einer alternativen Bewegung auf einer senkrechten, zu einer Zuführlinie (2) longitudinalen Ebene betätigten Klapparm (11) umfasst und für die Beförderung einer geordneten Reihe von einzuwickelnden Süßwaren bis zum Entnahmebereich geeignet ist, um Einzelprodukte von genanntem Entnahmebereich in einen davon entfernten Abgabebereich zu übertragen, in der Hebelmittel (30) geeignet sind, die Beförderung eines einzuwickelnden Produkts zu einem Verpackungskopf (3) zu betätigen; ein Greiforgan (13) der genannten zu übertragenden Einzelprodukte, das im Wesentlichen die Form einer Zange hat, von genanntem Klapparm (11) getragen wird und mit einem Hebelpaar (14, 15) mit jeweiligen Backen (17, 18) genannter Zangen versehen ist, wobei genannte Hebel (14, 15) auf genanntem Klapparm (11) mit der gleichen von einem Gelenkbolzen (16) definierten Drehachse verzapft sind, wobei genannte Backen (17, 18) zum Schließen mittels der Winkeldrehung genannter Hebel (14, 15) betätigt werden können; kinematische Mittel (21, 22), die für die Steuerung der Winkeldrehung in der gleichen Richtung genannter Hebel (14, 15) des Greiforgans (13) geeignet sind, so dass eine entsprechende Winkeldrehung genannter Backen (17, 18) verursacht wird, um simultan mit der Kippbewegung des genannten Arms (11) des Übertragungs- und Ausrichtungsorgans (10) die Verschiebung genannter einzuwickelnder Produkte auf einer senkrechten Ebene, die zu genannter Zuführlinie (2) longitudinalen Ebene parallel ist, auszuführen.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** genannte Hebel (14, 15) des Greiforgans (13) auf genanntem Klapparm (11) mit einer Drehachse verzapft sind, die auf einer zur Drehachse dieses Klapparms (11) senkrechten Ebene liegt.
3. Vorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** genannte kinematische Mittel ein Paar Kipphebel (21, 22) umfassen, die um die

gleiche Drehachse gedreht werden können, die senkrecht zu dieser zur Zuführlinie (2) longitudinalen senkrechten Ebene und mittels entsprechenden Spannelementen (19) gelenkig zu jeweiligen genannten Hebeln (14, 15) des Greiforgans (13) angebracht ist.

4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** genannte Kipphebel (21, 22) unabhängig von den jeweiligen Nockenmitteln betätigt werden.
5. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** genannte Spannelemente (19) auf genannten Kipphebeln (21, 22) und auf genannten Hebeln (14, 15) des Greiforgans (13) mittels jeweiligen kugelförmigen Verbindungselementen (23) verzapft sind.
6. Vorrichtung nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** genannte Hebel (14, 15) des Greiforgans (13) jeweils auf einem Zahn einer von genanntem Klapparm (11) ausgebildeten Gabel (12) verzapft sind.
7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** genannte Backen (17, 18) austauschbar an genannten entsprechenden Hebeln (14, 15) des Greiforgans (13) montiert sind.
8. Maschine zum Einwickeln von Süßwaren die eine Zuführvorrichtung nach einem der vorhergehenden Ansprüche umfasst.

Revendications

1. Dispositif d'alimentation pour enveloppeuses de produits de confiserie **caractérisé en ce qu'il** comprend une unité de transfert et d'orientation (10) comprenant un bras basculant (11) actionné en mouvement alterné sur un plan vertical longitudinal par rapport à une ligne d'alimentation (2), apte à transporter une série ordonnée de produits de confiserie à envelopper jusqu'à une zone de prélèvement, pour transférer les produits individuels de ladite zone de prélèvement à une zone de délivrance située à distance où des moyens de levage (30) sont aptes à actionner le transport d'un produit à envelopper vers une tête de conditionnement (3) ;
un organe de préhension (13) desdits produits individuels à transférer, ayant sensiblement la forme de pinces, porté par ledit bras basculant (11) et muni d'une paire de leviers (14, 15) portant des respectives mâchoires (17, 18) desdites pinces, lesdits leviers (14, 15) étant montés à pivotement sur ledit bras basculant (11) selon un même axe de rotation défini par un pivot articulé (16) ; lesdites mâchoires

(17, 18) étant actionnables pour fermer par rotation angulaire desdits leviers (14, 15) ; des moyens cinématiques (21, 22) aptes à commander la rotation angulaire dans la même direction desdits leviers (14, 15) de l'organe de préhension (13) de façon à entraîner une rotation angulaire correspondante desdites mâchoires (17, 18) pour effectuer, simultanément au mouvement basculant dudit bras (11) de l'organe de transfert et d'orientation (10), le déplacement desdits produits à envelopper sur un plan vertical et parallèle audit plan longitudinal à la ligne d'alimentation (2).

2. Dispositif selon la revendication 1, **caractérisé en ce que** lesdits leviers (14, 15) de l'organe de préhension (13) sont montés à pivotement sur ledit bras basculant (11) selon un axe de rotation situé sur un plan perpendiculaire à l'axe de rotation du bras basculant lui-même (11).
3. Dispositif selon la revendication 1 ou 2, **caractérisé en ce que** lesdits moyens cinématiques comprennent deux leviers culbuteurs (21, 22) tournants sur un même axe de rotation perpendiculaire audit plan vertical longitudinal par rapport à la ligne d'alimentation (2) et articulé respectivement auxdits leviers (14, 15) de l'organe de préhension (13) par l'intermédiaire des éléments tirants relatifs (19).
4. Dispositif selon la revendication 3, **caractérisé en ce que** lesdits leviers culbuteurs (21, 22) sont actionnés de façon indépendante par des moyens à came respectifs.
5. Dispositif selon la revendication 3, **caractérisé en ce que** lesdits éléments tirants (19) sont montés à pivotement sur lesdits leviers culbuteurs (21, 22) et sur lesdits leviers (14, 15) de l'organe de préhension (13) par l'intermédiaire des organes de jonction sphériques respectifs (23).
6. Dispositif selon la revendication 2 ou 3, **caractérisé en ce que** lesdits leviers (14, 15) de l'organe de préhension (13) sont montés à pivotement chacun sur la dent d'une fourche (12) conformée par ledit bras basculant (11).
7. Dispositif selon la revendication 6, **caractérisé en ce que** lesdites mâchoires (17, 18) sont montées de façon interchangeable sur lesdits leviers respectifs (14, 15) de l'organe de préhension (13).
8. Machine pour envelopper des produits de confiserie comprenant un dispositif d'alimentation selon une des revendications précédentes.

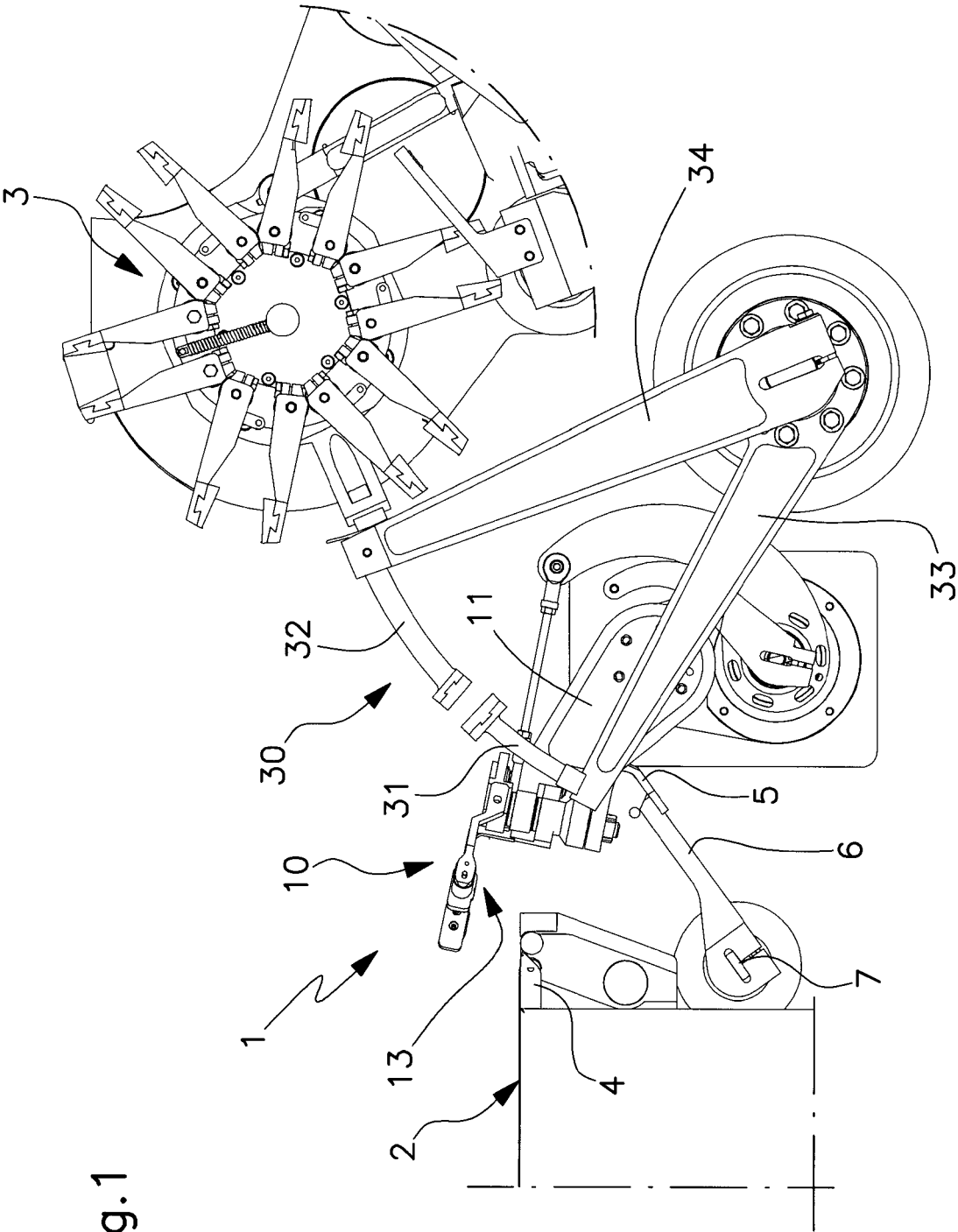
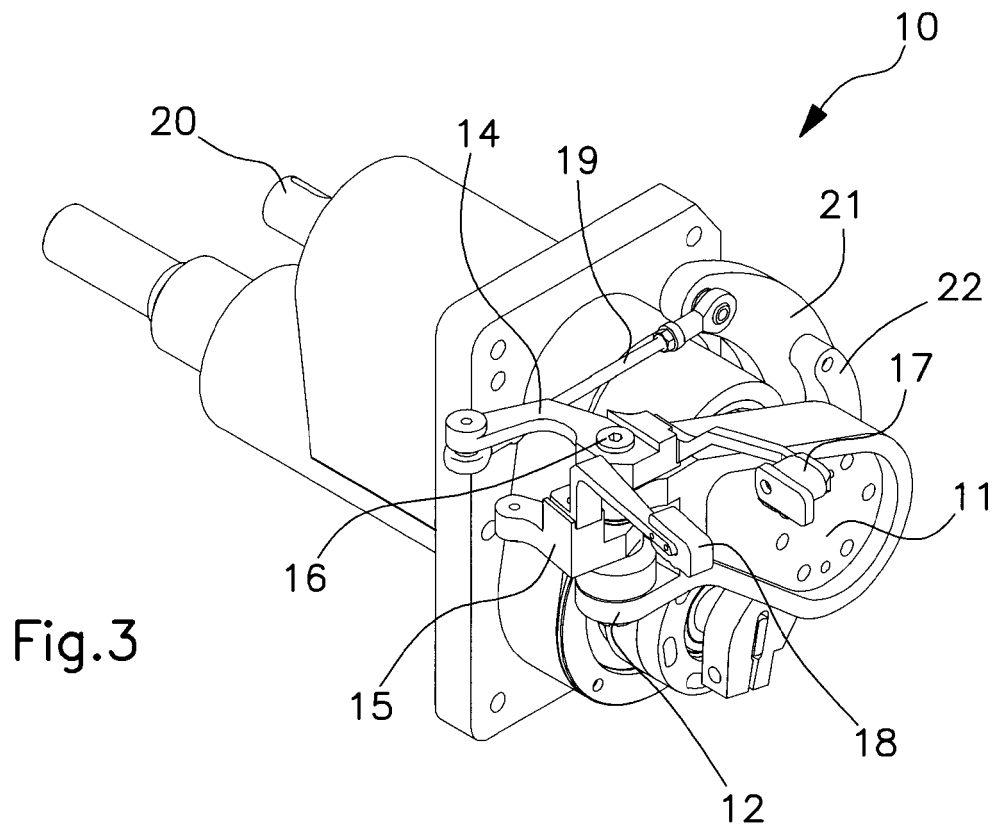
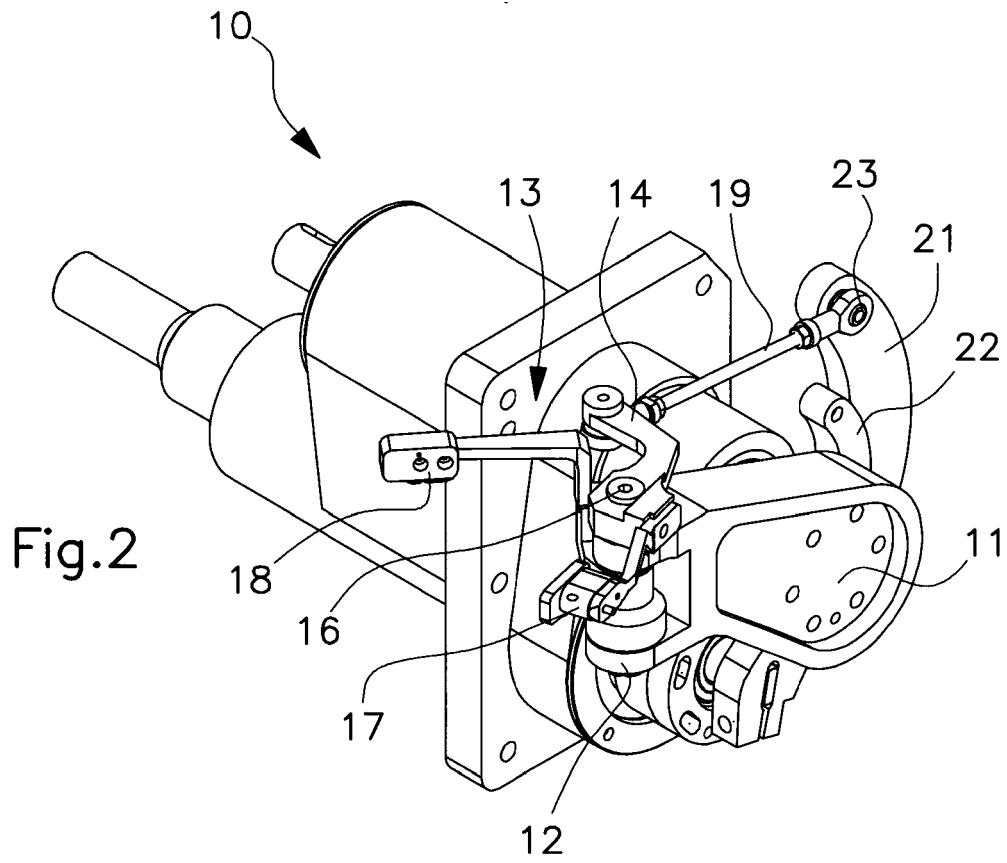
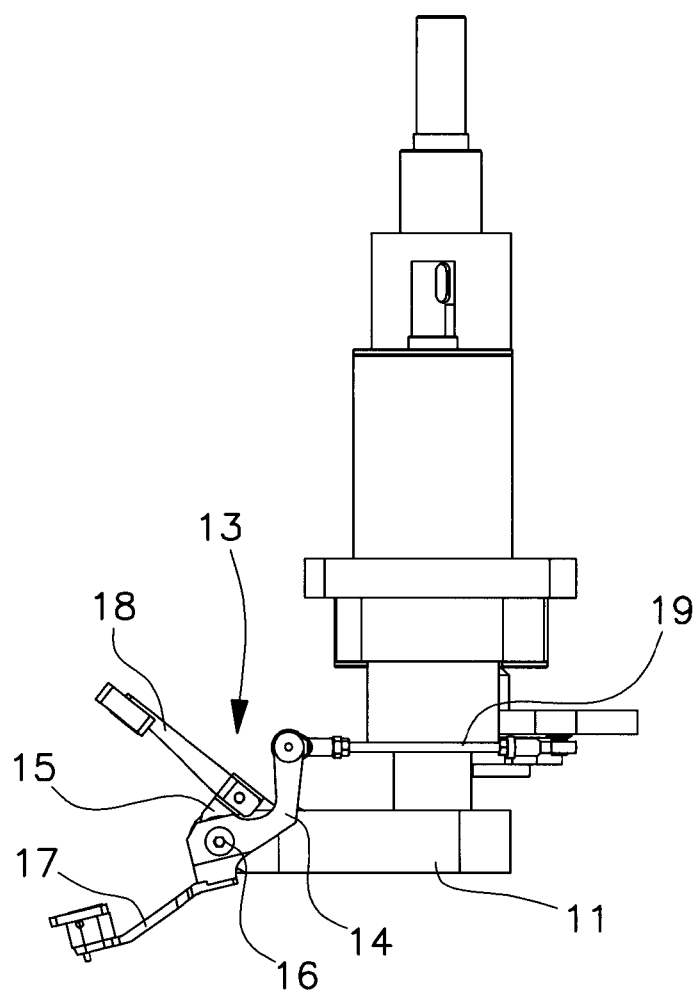
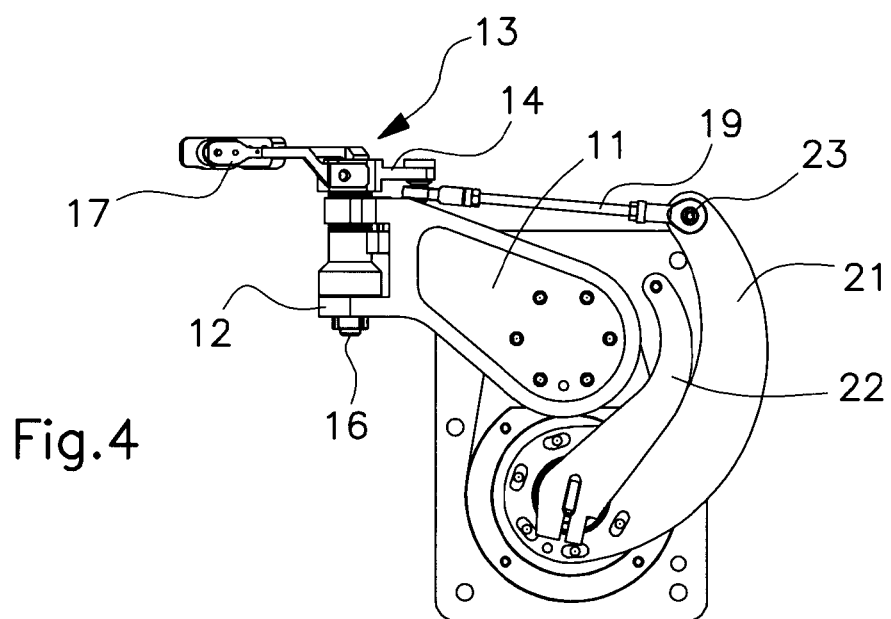


Fig.1





REFERENCES CITED IN THE DESCRIPTION

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