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(54) **TRANSFER APPARATUS FOR LIDS**

ÜBERGABEVORRICHTUNG FÜR DECKELN

APPAREIL DE TRANSFERT DE COUVERCLES

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Description

[0001] The subject of the present invention is an apparatus for transferring objects according to the preamble of claim 1, in particular lids, and an apparatus for removing a wrapping film from packages of objects or products according to the preamble of claim 24 and an apparatus for applying a packaging film to a group of objects according to claim 29.

[0002] The present invention is applicable particularly in the field of the production of lids to be fastened on containers, for example food containers, but may also be applied in different fields for removing a wrapping film from one or more products, possibly of different kinds. Moreover, in the field of lids, the lids may be of various shapes and sizes since, for example, round, elliptical or rectangular lids are available. An apparatus for transferring lids is disclosed in US-A-4312172.

[0003] The packages are generally produced by a suitable apparatus in which the objects are arranged close together and covered with a film of heat-shrinkable material so as to form a pack.

[0004] In the case of lids, they are arranged close together along an axis perpendicular to the major surfaces of the lids and are covered with a film of heat-shrinkable material so as to form a pack, also known as a roll, the length and size of which are variable in dependence on the number, shape and size of the lids.

[0005] The film covers the lateral surface of the package, that is, the lateral surface of the cylinder for round lids, or the sides of the parallelepiped for rectangular lids. Moreover, in the region of the first and last lids, that is, in the region of the head portions or ends of the pack, the film is folded towards the centre, generally leaving a small opening which, in any case, has dimensions smaller than the transverse dimensions of the lid. This portion of the film which is folded over at the ends of the package is generally thicker and stronger than the remaining portion which covers the lateral surface.

[0006] Before going on to subsequent processes such as, for example, the positioning and fastening of the lids on the respective containers, the packs or rolls of lids have to be freed from the wrapping film in order to make the loose lids available to an apparatus immediately downstream, for example, an apparatus for fastening the lids on the respective containers.

[0007] An apparatus for removing wrapping film from packages generally comprises means for cutting the wrapping film, the cutting means being mounted in a cutting region disposed between a region for the input of the packages and a region for the output of the objects free of the wrapping film.

[0008] A particular need in the field is to make available an apparatus for removing the wrapping film from packages, for example of lids, which can perform this operation in the simplest, quickest and most economical manner, at the same time producing a finished product of high quality.

[0009] Currently, this need is satisfied by apparatus which takes the packaged rolls from a storage container and sends them along a path within the apparatus, in which the packages are arranged with their longitudinal axes parallel to one another and transverse the path followed.

[0010] The packages collected in the storage container are lifted along an inclined plane and pushed by bars arranged transverse the path followed. In particular, the packages are arranged with their longitudinal axes parallel to the longitudinal axes of the bars so that the packages and the bars are substantially in contact along respective generatrices of their lateral surfaces. At the same time, the packages bear on the inclined plane, along which they slide, pushed by the bars.

[0011] A chain which is associated with each of the two sides of the inclined plane on which the packages are lifted and is driven by a suitable drive unit, has at least one portion parallel to the plane. An end of each bar is fixed to the chain.

[0012] The package thus taken from the storage container is brought to the top of the inclined plane and is then subjected to cutting of the wrapping film.

[0013] The loose lids are then transferred into a discharge cradle and from there are sent to the downstream apparatus by means of a thrust element.

[0014] Although apparatus of known type as described briefly above solves the problem of cutting the wrapping film of a package of lids, it has considerable disadvantages.

[0015] These disadvantages relate, in particular, to the stage of transfer from the cutting station to the output region and from there to the apparatus downstream of the apparatus which removes the wrapping film. These disadvantages relate both to the apparatus for removing the wrapping film and to the apparatus which transfers the objects towards the apparatus downstream, irrespective of its application. In fact when the objects and in particular the lids are free of wrapping film, bouncing of the lids or turning-over of the first or the last lid can occur and generate consequences such as, in order of increasing seriousness, loss of a lid, damage to the receiving seat or to the thrust element, interruption of the process due to the fact that the turned-over lid is jammed along the thrusting devices or the communication casing between two processing devices, or complete turning through 180° which causes stoppage of the machine filling the containers, with consequent loss of its sterility, in the case of food containers, and a risk of contamination of all the containers being processed.

[0016] The problem underlying the present invention is to propose a transfer apparatus and an apparatus for removing a wrapping film from packages of objects, in particular of lids, as well as an apparatus for applying a packaging film to a group of objects, in particular of lids, which have structural and functional characteristics such as to satisfy the above-mentioned needs and, at the same time, to overcome the disadvantages mentioned with ref-

erence to the prior art.

[0017] This problem is solved by a transfer apparatus according to Claim 1, by an apparatus for removing a wrapping film from packages of objects, in particular of lids, according to Claim 24, and by an apparatus for the application of a packaging film to a group of objects, in particular of lids, according to Claim 29.

[0018] Further characteristics and the advantages of the apparatus and of the method according to the present invention will become clear from the following description of preferred embodiments thereof, given by way of non-limiting example without departing from the scope of the appended claims, with reference to the appended drawings, in which:

Figure 1 is a schematic, perspective view of an apparatus for removing a wrapping film from packages of objects or products according to the present invention,

Figure 2 is a section through the apparatus of Figure 1, taken in a median plane perpendicular to the axis of the packages,

Figure 3 is a perspective view of a detail of Figure 2,

Figure 4 is a front view of a detail of Figure 2, taken on the arrow IV,

Figure 5 is a section through the detail of Figure 4, taken on the line V-V,

Figure 6 is a section through a detail of the apparatus of Figure 1, taken in a median plane perpendicular to the axis of the packages,

Figure 7 is a schematic perspective view of a detail of the apparatus for removing a wrapping film from packages of objects of products according to the present invention,

Figure 8 is a front view of the detail of Figure 7, taken on the arrow VII of Figure 1,

Figure 9 is a section through the detail of Figure 8, taken on the line IX-IX,

Figure 10 is a schematic, perspective view of a detail of the apparatus for removing a packaging film from packages of objects or products according to the present invention,

Figure 11 is a front view of the detail of Figure 10, taken on the arrow XI of Figure 2,

Figure 12 is a section through the detail of Figure 11, taken on the line XI-XI,

Figure 13 is a perspective view of a package of objects, for example lids, according to a possible embodiment, and

Figure 14 is a possible variant of the detail of Figure 10.

[0019] With reference to the drawings, an apparatus for removing a wrapping film 2 from packages 3 of objects, for example, of lids 4, is generally indicated 1.

[0020] The embodiment shown relates to a plurality of round lids arranged close together along the axis of symmetry of each lid. The package is shown by way of example in Figure 13 and, in the case of round lids, thus adopts the shape of a cylindrical pack which extends along a major axis AA perpendicular to the larger surfaces of the lids. Generally, a package or roll has a length of between 500 and 800 mm.

[0021] The wrapping film 2 envelops the lateral surface and part of the two ends or head portions of the package 3, holding the lids 4 close together. In particular, the portion of film which envelops the lateral surface of the package 3 is indicated 2a and the portions which are folded over the ends of the package are indicated 2b.

[0022] The apparatus 1 extends inside a basic structure 5 which represents a framework for supporting and protecting the moving mechanisms. A loading apparatus 6, comprising a storage container 6a and supply means 6b which take a package from the container and direct it towards an input region of the apparatus 1, may advantageously be associated with this independent basic structure 5.

[0023] The loading apparatus 6 may be connected firmly to the apparatus 1 and share its basic structure and drive unit or, preferably, may be independent as shown, for example, in Figures 1, 2 and 6.

[0024] In the embodiment shown in Figure 1, the loading apparatus 6 is independent of the apparatus 1 with regard both to its drive and to its structure. The apparatus 6 has an outer framework 7 which is preferably trolley-mounted so that it can easily be moved up to and away from the apparatus 1. The trolley-mounted portion is advantageously of adjustable height (Figure 6) so that the loading apparatus 6 can be associated correctly with an apparatus 1, as described below.

[0025] The container 6a is constituted by a support surface 8 which is substantially horizontal or is slightly inclined in order to direct the packages towards a withdrawal point where they are withdrawn individually.

[0026] The support surface 8 has one side articulated to a portion of the framework 7 and the opposite side connected to an external portion of the framework 7 provided with adjustable support feet (Figure 6).

[0027] The support surface 8 may advantageously be surrounded on two sides by delimiting walls 8a, whereas one side is preferably left free for the loading of the packages which may be introduced manually or by means of a mechanical arm. The fourth side represents the package-withdrawal region.

[0028] As shown, for example, in the drawings, the support surface 8 is supported by the framework 7 which advantageously positions it at a height convenient for the operator performing the loading.

[0029] As stated above, the packages 3 are withdrawn from the storage container 6a individually and are sent towards an input region of the apparatus 1, generally indicated 9 in the drawings. This input region may constitute a region for connection to the loading apparatus 6, as shown, for example in Figure 2. In applications not shown, the input region 9 may constitute a region for direct access to the apparatus 1 in which, for example,

an operator can position the packages manually if the loading apparatus 6 is not present, or may constitute an input region to which a loading apparatus configured differently from that shown, for example, with the packages moved in a direction parallel to their longitudinal axes, can be connected.

[0030] In the embodiment shown in Figures 2 and 6, the loading apparatus 6 is arranged in a manner such as to withdraw the packages 3 from the container 6a individually and to send them to the input region 9 along a path 10 perpendicular to the longitudinal axes AA of the packages.

[0031] Along the path 10, the packages 3 are arranged with their longitudinal axes parallel to one another and transverse the path followed.

[0032] At least a first portion 10a of the path 10 extends vertically from the support surface 8 to a height substantially corresponding to that of the input region 9 of the apparatus 1. The path 10 then continues with a second portion 10b which approaches the input region 9 and which is substantially horizontal or slightly inclined to the horizontal support surface of the apparatus.

[0033] A first surface, along which the packages 3 slide and which defines the first portion 10a of the path 10, extending in a substantially vertical direction, is indicated 11. In the region of the surface 8 on which the packages 3 are disposed, the vertical surface 11 has a rib 11a which restricts the opening between the vertical surface 11 and the end of the surface 8.

[0034] A second surface 12 extends continuously from the first surface 11 as far as the input region 9 of the apparatus 1 and defines the second portion 10b of the path 10, extending horizontally or at a slight inclination to a horizontal plane so that the second portion 10b of the path 10 rises slightly (Figures 2 and 6).

[0035] The supply means 6b are associated with a portion of the framework 7 corresponding to a parallelepipedal portion suitable for being fixed to the basic structure 5 of the apparatus 1, if the loading apparatus 6 is independent, as shown, for example, in Figure 2 or Figure 6.

[0036] The supply means 6b comprise two chains 13 of which one is shown schematically in Figure 6, and which are mounted in respective vertical planes arranged transverse the first and second surfaces 11 and 12. The two chains 13 and the respective vertical planes, are spaced apart by a distance such as to house a package arranged along its major axis, that is, along the longitudinal axis AA in the case of the packages of Figure 13.

[0037] These chains 13 are contained within the framework 7 of the loading apparatus 6 and are driven by a drive unit independent of that of the apparatus 1. The framework 7 preferably has a cover 7a which isolates a portion of the path 10 in the closed position and which permits cleaning and maintenance of the loading apparatus 6 in the open position.

[0038] The chains are mounted on transmission elements in a manner such that portions of the chains are superimposed on the path 10 (portions 10a and 10b) of the longitudinal axes of the packages 3. As a result, a portion of each chain 13 preferably extends vertically during its movement over the respective transmission elements. In fact, the chains 13 are preferably arranged at least partially parallel to the first and second surfaces 11 and 12.

[0039] Some of the transmission elements may be adjustable in order to move the chains towards or away from the first and second surfaces 11 and 12 in dependence on the transverse dimensions of the packages. The adjustment undergone will preferably keep the chain at least partially parallel to the first and second surfaces 11 and 12, that is, to the path 10.

[0040] The chains 13 move, pulling along a plurality of bars 14. The bars have ends fixed to the two chains 13, respectively, and are arranged perpendicular to the path 10 with their longitudinal axes arranged in planes parallel to the first and second surfaces 11 and 12.

[0041] Each bar 14 defines an abutment which pushes a package 3 from below. In particular, the packages 3 bear against the surface and are positioned against the corresponding bar 14. The packages 3 are in fact arranged with their longitudinal axes parallel to the longitudinal axes of the bars 14 so that the packages and the bars are substantially in contact along respective generatrices of their lateral surfaces. At the same time, the packages bear against the surface, along which they slide, pushed by the bars 14.

[0042] In the vertical portion 10a of the path 10, the gravitational force of the packages 3 (indicated by the arrow 15 of Figure 2 or Figure 6) and of the bars 14 is not discharged onto the respective surface 11 but parallel thereto, without components perpendicular to the surface which would generate a frictional force component.

[0043] In the region of the upper end of the surface 12, the framework 7 has an opening 16 such as to allow the packages 3 to pass from the loading apparatus 6 to the input region 9 of the apparatus 1.

[0044] The input region 9 can comprise a surface 17 for the sliding of the packages 3. The ends of the surface 17 can be fixed firmly to the basic structure 5 which, naturally, has an access opening 17 in the input region 9, facing the opening 16 of the framework 7 of the loading apparatus 6. The sliding surface 17 is advantageously mounted on the basic structure 5 by adjustment means 17a which define its height and/or inclination.

[0045] The surface 17 for the sliding of the packages 3 is preferably inclined slightly downwards, with reference to a direction of movement P of the packages, in order to direct the packages, avoiding the need for motorized actuation (Figure 2).

[0046] The apparatus 1 is arranged in a manner such as to receive the packages 3 through the input region 9 and to position them in a cutting station 19 in which the film 2 which forms the package is cut and expelled from the apparatus. The lids 4 or, in general, the objects, previously packaged are then sent, free of the wrapping film 2, to an output region 20 from which they are sent out of

the apparatus 1 towards subsequent processing stations, not shown. For lids, the subsequent stations may be, for example, stations for positioning and fastening the lids on respective containers.

[0047] The apparatus 1 for removing the wrapping film 2 is preferably associated with the loading apparatus 6 as shown in the appended drawings, in order to receive the packages 3 at the input region 9.

[0048] Inside the apparatus 1, the cutting station 19 is arranged in an intermediate region between the input region 9 and the output region 20, for example, immediately downstream of the sliding surface 17 in the direction of movement of the packages, for example, indicated by the arrow P in Figure 2. As the package arrives from the surface 17, it is inserted between two rods 19a associated with translation means 19b. A possible configuration of the cutting station 19 is shown by way of example in Figures 3-5.

[0049] The cutting station 19 preferably comprises two rollers 21 arranged transverse the path 10 followed by the packages in the loading apparatus 6, as described above. The rollers 21 preferably have parallel rotation axes disposed in a horizontal plane which in turn is disposed below and downstream of the sliding surface 17, in the direction of movement P of the packages 3.

[0050] The two rollers 21 are mounted for rotating relative to the basic structure 5 of the apparatus 1, parallel to one another and substantially side by side, so as to define a region for receiving a package coming from the input region 9.

[0051] The rollers 21 are arranged in a manner such that the package, indicated 3a in Figure 2, which is positioned in the cutting station 19, is in contact with both of the rollers 21 along generatrices of the package and of the respective rollers. The two rollers 21 are also preferably in contact along respective generatrices thereof.

[0052] The rollers 21 are operatively connected to a drive unit which can bring about a contrarotation of the rollers 21, preferably such as to grasp and remove the cut film 2. The directions of the rotation imparted to the two rollers 21 are indicated by the arrows 22 in Figures 2 and 5.

[0053] Two pressure rollers, indicated 23, have longitudinal axes parallel to the axes of the rollers 21 and disposed above them. The axes of the pressure rollers 23 are also preferably arranged parallel to one another and in a horizontal plane. The two pressure rollers 23 can be disposed a predetermined distance apart (Figures 2 and 5).

[0054] The pressure rollers 23 can have ends mounted rotatably on supports 24 which in turn are engaged on the basic structure 5 so as to be translatable vertically (Figure 2) or pivotable relative to a fixed point.

[0055] As shown, for example, in Figure 4, during cutting, the pressure rollers 23 are in contact with the package 3a and can be contrarotated by a drive unit 25 in order to stretch out the wrapping film 2 during the cutting and then to open it out along the cutting line.

[0056] The cutting station 19 also comprises cutting means 26 which operate on the wrapping film 2.

[0057] The cutting means 26 advantageously comprise two cutting heads 27 mounted on carriages 28 movable relative to the basic structure 5 of the apparatus 1 along an axis parallel to the longitudinal axes AA of the packages 33 as they are arranged in the cutting station 19 (package 3a).

[0058] The carriages 28 are associated slidably with guides 29 parallel to the longitudinal axis AA of the package 3a positioned in the cutting station 19. The guides 29 are formed, for example, by rods the axes of which are disposed in a vertical plane. The ends of the guides 29 are preferably mounted on the supports 24 in order to move relative to the basic structure 5, together with the pressure rollers 23.

[0059] The carriages 28 are associated with a drive unit suitable for causing them to translate along an axis parallel to the axis AA of the package 3a, in opposite directions. The two carriages 28 are advantageously operatively connected to the same drive unit 30 which moves them simultaneously in the two opposite directions.

[0060] The drive unit 30 comprises, for example, a toothed belt 31 which can pass over transmission elements 32 of which at least one is driven. In the embodiment shown in Figure 4, the toothed belt 31 extends at least between a driven toothed wheel and an idle toothed wheel, which are mounted on opposite sides of the median plane along which the section of Figure 2 has been drawn.

[0061] The transmission elements 32 are mounted on the supports 24 so as to render the pressure roller 23, the guides 29, and the belt 31 movable simultaneously relative to the basic structure 5.

[0062] In the embodiment of Figure 4, the two transmission elements 32 define two portions of the belt 31, that is, a first, upper portion 31a and a second, lower portion 31b, both parallel to the guides 29 and hence to the longitudinal axis AA of the package 3a.

[0063] According to one optional embodiment, each carriage 28 is connected to a belt portion which moves in the opposite direction to the other belt portion to which the other carriage is connected. That is, with reference to the embodiment of Figure 4, one carriage 28 is connected to the first, upper portion 31a and the other carriage 28 is connected to the second, lower portion 31b (Figure 5).

[0064] The drive unit 30 gives rise to a translational movement of the carriages 28 from an initial position, preferably corresponding to a central position relative to the package 3a to be opened, to a final position, preferably corresponding to respective end positions relative to the package. In particular, each carriage 38 moves parallel to the longitudinal axis AA of the package 3a, but in the opposite direction to the other carriage, from the centre of the package to the respective head portion or end, preferably cutting firstly the central portion 2a and

then the end portion 2b of the film.

[0065] The drive unit 30 preferably also comprises means for adjusting the positions of the carriages 28 in dependence on the length of the package to be opened. These adjustment means are operatively connected to one of the carriages in order to define its initial position, that is, the position depending on the central region of the packaging 3a. The travel limit of the carriage, that is, the final position corresponding to the end of the package, is preferably reached by regulation of the drive unit (via encoders and/or sensors). These regulation means can act on one of the carriages directly and on the other indirectly. The indirect effect is achieved, for example, as a consequence of the fact that both carriages 28 are driven in the two opposite directions by the same toothed belt 31.

[0066] The drive unit 30 of the carriages 28, and hence of the cutting heads 27, may be arranged in a manner such as to move the carriages substantially continuously when they are facing the lateral surface 2a of the film and to interrupt the movement of the carriages momentarily when they are in the region of the ends 2b of the wrapping film.

[0067] Each cutting head 27 is formed, for example, by a nozzle 32 connected by means of tubes 33 to a source of heated fluid, particularly superheated air (at about 200°), not shown in the drawing.

[0068] Each carriage 28 and each cutting head 27 are positioned in a manner such that, during the cutting and the translational movement of the carriages parallel to the longitudinal axis AA of the package 3a, each nozzle 32 is disposed between the two pressure rollers 23 (Figures 2 and 5).

[0069] A suction duct 34 has a portion which faces the two rollers 21 from below, along the generatrix along which the rollers are placed side by side. This duct is connected to a suction unit 35 and terminates in a container for recovering the wrapping film 2.

[0070] The cutting of the wrapping film of a package 3 of objects, in particular lids 4, can provide for a package 3a to be positioned in a cutting station and for cutting to start simultaneously at two distinct points of the film with the use of two cutting heads. The opening in the film is then lengthened until it covers an entire dimension of the package, by relative movement of the cutting heads and the package 3a to be opened.

[0071] The cutting step can start at two central points of the package, the opening then being lengthened as far as the head portions or ends of the package 3a.

[0072] The step of the cutting of the lateral portion 2a of the film may be arranged to take place substantially continuously, that is, with a continuous movement of the cutting heads, whereas the step of the cutting of the end portion 2b of the film takes place with the movement of the respective cutting head interrupted, that is, by causing the respective cutting head to pause on the portion 2b of the wrapping film.

[0073] There may be provision for a step for stretching out the film in the vicinity of the region in which the cut is performed, a grasping step, and a step for removal of the cut wrapping film. The stretching-out step may be performed by the pressure rollers 23, the grasping step by the rollers 21, and the removal step by suction through the suction duct 34.

[0074] Downstream of the cutting station 19 in the direction of movement P, the apparatus 1 comprises the above-mentioned output region 20, where there is a seat 36 for receiving a group of objects, in the embodiment described, a group of lids 4, free of wrapping film 2 and coming from the cutting station 19. The group of lids is dragged into the seat 36 by the rods 19a and by the means 19b.

[0075] The receiving seat 36 comprises a wall 37 mounted on the basic structure 5 and defining an output channel which extends along a longitudinal axis BB, preferably parallel to the axes of the rollers 21, that is, perpendicular to the portion of the path followed by the packages 3 inside the apparatus 1.

[0076] The cross-section of the wall 37 is preferably of a shape complementary to at least a portion of the cross-section of the objects in question. The wall 37 extends around a cylindrical angular sector of a shape complementary to a portion of the circular cross-section of the lids 4 and has longitudinal edges 37a which are bent to form substantially radial flanges.

[0077] The wall 37 may not have closed ends, and thus forms a double-ended output channel with two possible outputs formed by respective openings in the side walls of the basic structure 5. These outputs are advantageously distinct, arranged opposite one another, and selectable in dependence on the layout of the plant.

[0078] A detail of the output region 20 is shown schematically by way of example in Figures 7, 8 and 9. In addition to the receiving seat 36, movement means 38 are provided for causing the lids 4 to translate along the seat 36 towards the previously selected output.

[0079] In the embodiment of Figure 2, the seat 36 and the movement means 38 are associated with an apparatus 1 for removing a wrapping film from packages of objects or products, in the case in question, of lids 4. However, other applications may be envisaged, for example, in an input region of a machine for creating the packages 3 starting with a set of lids 4.

[0080] The movement means 38 comprise a thrust element 39 for acting on the end of the group of lids 4 remote from the output. The thrust element preferably has a cross-section such as to fit the seat 36, that is, it has a cross-section substantially corresponding to the cross-sections of the lids. The thrust element may have a slot 39a for a stop finger positioned at the end of the seat 36 for stopping the lids when the thrust element 39 returns to the initial position, as described below.

[0081] The thrust element 39 is operatively associated with a slide 40 which in turn is slidable on a guide 41 mounted on the basic structure 5, preferably parallel to the longitudinal axis BB of the seat 36. The connection

between the thrust element 39 and the slide 40 is preferably formed by a rigid rod 42 arranged transverse the longitudinal axis BB of the seat 36.

[0082] The slide 40 is advantageously connected to a counterweight 43, for example, by means of a cable 44, which may also be formed by a chain or toothed belt. The counterweight 43 is disposed on the output side of the lids 4 and the cable 44 is wound partially around a pulley 45 with a horizontal axis. This arrangement, which is shown, for example, in Figure 7 or Figure 8, provides for the cable portion 44 between the pulley 45 and the counterweight 43 to be arranged vertically.

[0083] The thrust element 39, the slide 40, and the counterweight 43 define thrust movement means which operate by gravity until the portion of cable 44 between the slide 40 and the pulley 45 has run out, whilst the counterweight 43 is lowered from an initial (raised) position to a final (lowered) position.

[0084] According to one possible embodiment, shown in Figure 7, a guide element 46 is provided and, for example, is formed by a guide tube suitable for housing and guiding the counterweight 43 during its movement.

[0085] The movement means 38 also comprise return means 47 for returning the counterweight from the lowered position, referred to above as the final position, to the raised position, referred to above as the initial position.

[0086] According to one possible embodiment, the return means 47 comprise a toothed belt 48 wound around two transmission elements 49, of which one is operatively connected to a geared motor unit 50. A portion of the toothed belt 48 is fixed to the slide 40.

[0087] According to one possible embodiment, the return means 47 also comprise sensor means, not shown, for detecting the discharge of the lids, for example, by detecting the final (lowered) position of the counterweight 43 or the final position of the thrust element 39, and for bringing about the operation of the geared motor unit 50 and consequently the return of the movement means.

[0088] The movement means 38 may equally well be mounted in a manner such as to direct the lids along the receiving seat 36 in one direction or in the opposite direction. This selection is made during the assembly of the apparatus 1 in dependence on the user's requirements.

[0089] Anti-bouncing and anti-overturning means 51 are associated with the seat 36 for receiving the lids 4 and with the movement means 28 to prevent the lids, particularly the first and last lids in the group free of wrapping film, from overturning.

[0090] One possible embodiment of the anti-bouncing and anti-overturning means 51 is shown by way of example in Figures 2 and 10-12. Figure 2 corresponds to the application of these means to the output region of an apparatus for removing a wrapping film from packages of objects, in particular of lids. However, other applications in which it is desired to prevent lids free of wrapping film from overturning may be envisaged. An example of such other applications may be represented by the input region of an apparatus for creating packages, for example of lids, by the application of a wrapping film.

[0091] According to the embodiment of Figures 11 and 12, the anti-bouncing and anti-overturning means 51 comprise an electromagnet 52 mounted on the basic structure 5 in a stationary manner, preferably beneath the wall 37 defining the seat 36 for receiving the lids free of wrapping film.

[0092] The electromagnet 52 is advantageously of elongate shape extending along the longitudinal axis BB of the seat 36. According to one possible embodiment, the electromagnet 52 is placed in contact with the wall 37 and extends around a portion thereof, having a wall 52a of substantially the same shape as at least a portion of the wall 37. In the embodiment of Figures 11 and 12, the wall 52a of the electromagnet is a cylindrical portion with a radius equal to the radius of the wall 37.

[0093] The electromagnet 52 is operatively connected to selective activation means, not shown, which activate the electromagnet only during a predetermined stage of the operation of the apparatus 1, activation of the electromagnet meaning its ability to generate a magnetic force.

[0094] In particular, the electromagnet 52 is active during the stage of the movement of the lids 4 free of wrapping film from the rollers 21 to the seat 36 and preferably remains active until the thrust element 39 compacts the group of lids against the group disposed immediately downstream.

[0095] A description of the operation of an apparatus for removing a wrapping film from packages of objects and of some components thereof, shown by way of example, as described above, is given below.

[0096] The packages 3 are collected in the container 6a manually or by means of a mechanical arm which has access to the container by virtue of its open side. The packages 3 are withdrawn from the container 6a individually by the bars 14 which are translated parallel to themselves by means of the chains 13. Each package 3 is thus sent along the path 10 and is lifted along the first surface 11 and then along the second surface 12 which extends to a position facing the input region 9 of the apparatus 1.

[0097] Each package 3 is pulled continuously along the path 10 within the loading apparatus 6.

[0098] At the input to the apparatus 1, the packages 3 slide on the surface 17, which is suitably adjusted, until they reach the cutting station 19. In particular, the package 3a which faces the cutting means 26 bears on the rollers 21 so that its position is defined by that of the rollers 21 and of the pressure rollers 23 as soon as the supports 24 are lowered onto the package 3a.

[0099] The cutting heads 27 slide along the guides 29, driven by the drive unit 30, and cut the wrapping film 2 along a generatrix of the package 3a. The wrapping film 2 preferably starts to open out in a central region of the lateral portion 2a during the movement of the cutting

heads 27. Owing to the translation of the two heads in opposite directions, the opening in the film is enlarged towards both ends simultaneously. When the cutting heads have reached the vicinity of the respective ends, the translational movement of the respective carriages 28 is interrupted so that each head stops on the portion 2b of the wrapping film, that is, on the portion which is most difficult to cut because it is folded towards the interior of the package and is generally thicker than the rest of the film.

[0100] During the cutting stages, the pressure rollers 23 and/or the rollers 21 are rotated, as indicated in the drawings. The pressure rollers 23 stretch out the wrapping film and open it out along the cutting line, whilst the rollers 21 grasp the wrapping film and direct it towards the suction duct 34. The wrapping film is thus removed.

[0101] The positions of the cutting means 26 and of the pressure rollers 23 may be varied by action on the supports 24, causing them to translate vertically relative to the basic structure 5.

[0102] The lids 4, free of wrapping film, continue in the direction of movement, indicated P, and are positioned in the receiving seat 36. During this stage, the anti-bouncing and anti-overturning means 51 are activated and hold the lids 4 in the vertical position. Moreover, owing to the effect of the magnetic flux through the group of lids, the lids are moved apart slightly, occupying the entire space available between the thrust element 39 and the last lid of the immediately preceding group.

[0103] When the lids 4 are positioned in the receiving seat 36, the geared motor unit 50 releases the thrust element 39, the slide 40 and the counterweight 43 which, up to this moment, have been kept in the initial position (that is, with the thrust element 39 on the side remote from the output for the lids and with the counterweight 43 in the raised position) by the geared motor unit. As soon as the thrust unit 39 acts actively on the last lid, the anti-bouncing and anti-overturning means are deactivated, that is, the electromagnet is no longer excited by the current and the lids 4 are free to slide in the seat 36.

[0104] By virtue of the gravitational force exerted by the counterweight 43, the thrust element 39 urges the lids towards the output, compacting them against the immediately preceding lids. Clearly, by virtue of the action due to gravity of the thrust element 39, the lids 4 are urged towards the output only when there is a requirement downstream, that is, when the apparatus following that described herein is operating correctly. If this is not the case, that is, in the event of stoppage of an apparatus downstream, the apparatus 1 is not stopped but simply enters a standby stage which will be resolved, without release operations, as soon as there is a renewed demand for lids downstream.

[0105] The slide 40 slides along the guide 41 and the belt 48 runs over the respective transmission elements 49 until the sensor means detect that all of the lids have been discharged. This configuration corresponds to the lowered position of the counterweight 43. At this point, the sensor means activate the geared motor unit 50 which returns the slide 40 by means of the belt 48 so that the counterweight 43 returns to the raised position and the thrust element 39 returns to the initial position.

[0106] As can be appreciated from the foregoing description, the apparatus according to the present invention satisfies the need to provide an apparatus for removing the wrapping film from packages of objects, for example of lids, which can perform this operation more simply, quickly and economically, at the same time producing a finished product of high quality.

[0107] In particular, the advantageous configuration of the cutting means enables a continuous cut to be produced along the packaging film, even in the vicinity of the ends of the roll, also helping to speed up processing times.

[0108] As well as satisfying the above-mentioned need, the presence of two cutting heads driven in opposite directions by the same drive unit also enables the structure to be simplified considerably and a prolonged stationary stage to be performed at the ends 2b of the wrapping film. This also enables the initial and final positions of one of the two heads to be adjusted, in dependence on the format of the package, achieving the adjustment of both simultaneously.

[0109] The optional provision of a cutting stage which starts from two distinct central points of the pack and proceeds towards the ends, and which can thus make best use of the interaction between the effect of the cutting head, the spreading action of the pressure rollers 23, and the grasping action of the rollers 21, is particularly advantageous.

[0110] In addition to the foregoing, the apparatus can enable packages to be withdrawn continuously and with a capability for adjustment in dependence on the format of the lids. This advantageous condition is achieved by the provision of supply means formed by bars mounted on chains, the position of which can be adjusted relative to a surface for the sliding of the packages.

[0111] Moreover the provision of a vertical loading surface enables frictional components on the surface to be eliminated since neither the weight of the packages nor that of the bars bears on the loading surface. The absence of these frictional components avoids any damage to the wrapping film or to the lids, at the same time facilitating the stage of supply to the apparatus 1. At the same time, the forces and stresses involved are reduced, and vibrations of the structure are minimized, thus prolonging its efficiency and eliminating the risk of jamming of the supply means.

[0112] The overall structure of the supply means enables the surface 8 of the container 6a to be positioned at a convenient height for the operator, who does not have to lean over into the container in order to position the packages.

[0113] In addition to the foregoing, the provision of a vertical loading surface, which may itself be independent of the configuration of the cutting means as described

above, considerably simplifies the variables necessary for the control of a mechanical arm performing the loading of the container 6a. This capability is favoured by the presence of an open side of the container.

[0114] In addition, the presence of a vertical loading surface simplifies the structure and reduces its overall size, that is, it increases the available volume of the container for a given space occupied. Although it may be provided independently, the presence of a vertical load surface, which enables the useful volume of the container to be increased, is particularly advantageous when combined with cutting means according to the present invention which, amongst other advantages, reduce cutting times.

[0115] The presence of a loading apparatus 6 which is independent of the apparatus 1, with regard both to its the external structure and to the drive units, enables the apparatus 1 to be used with any means which brings the packages into the vicinity of the input region 9, including manual means.

[0116] As well the facility to select the type of supply, the separation between the supply and the actual cutting permits greater accessibility to both apparatuses and hence improved facilities for cleaning them.

[0117] At the output of the apparatus 1, by virtue of the presence of movement means which can be fitted in both orientations, it is possible to produce an apparatus which sends the lids free of wrapping film towards two different outputs. The presence of two outputs and the facility to reverse the arrangement of some devices, enables stores to be limited and an apparatus with an output disposed on the right or on the left to be made available immediately according to the customer's needs. This facility can also be utilized directly by the user, in the event of modifications of the layout of the plant.

[0118] Moreover, the presence of gravity movement means, not necessarily for the application described, enables optimal reliability to be achieved and costs to be kept low. In fact the need, for example, for digital signals from one apparatus to the other to permit the movement of the lids and to stop the upstream apparatus in the event of stoppage of the downstream apparatus is avoided.

[0119] In fact, both at the output of an apparatus for removing a wrapping film and in other applications, the gravity movement means as described above stop automatically, by their very nature, if the machine downstream is not in a position to receive further lids, since the thrust element and the counterweight encounter, in the row of lids, a resistance which opposes the weight of the counterweight. Moreover, as soon as functional capability is restored downstream, the counterweight automatically overcomes the resistance to its descent offered by the row of lids and pushes them by means of the thrust element until the last lid has left the apparatus.

[0120] The supply means do not therefore require signals to stop the movement of the lids in the event of malfunctions of the line downstream and do not therefore require reactivation of the system but, by their very nature, adapt automatically to the demand. This means that the movement means allow the entire apparatus to operate between zero speed and maximum speed without adjustments, or rather with an automatic adjustment which does not require control by means of a signal from the receiving machine.

[0121] The presence of the magnetic means which can exert their force only during a predetermined stage of the operation of the apparatus permits the provision of particularly reliable anti-bouncing and anti-overturning means which do not complicate the structure of the apparatus as a whole. These means achieve their advantageous effect when associated with any seat for receiving, for example, lids, not necessarily for the application described. In addition, the combination of the magnetic anti-bouncing and anti-overturning means with the gravity movement means as described above is particularly synergic.

[0122] In fact, the presence of the magnetic anti-bouncing and anti-overturning means, optionally associated with gravity movement means prevents the problems due to the turning-over of the first or last lid whilst nevertheless retaining a simple and reliable structure. These problems may take the form, in order of increasing seriousness, of loss of a lid, of damage to the receiving seat or to the thrust element, of interruption of the process due to the fact that the turned-over lid is jammed along the communication casing between two processing devices, or of complete turning through 180° which causes stoppage of the machine filling the containers, with consequent loss of its sterility, in the case of food containers, and a risk of contamination of all of the containers being processed. Variations and/or additions may be provided for the embodiments described and illustrated above.

[0123] As stated above, the loading apparatus 6 may be independent of the apparatus 1, or the two apparatuses may form a single structure with a single drive unit. The advantageous presence of an independent loading apparatus 6 may not be dependent on the internal characteristics of the apparatus 1, that is, on the configuration of the cutting means or of the means for moving the lids, but possibly on the configuration of the basic structure and of the input region of the apparatus 1. Combination with cutting and/or moving means as described above in any case gives rise to a generally simple and reliable apparatus.

[0124] The cutting heads as described above may have different configurations, for example, by the provision of a heated metal element instead of the jet of heated fluid.

[0125] The drive unit of the cutting heads 27 and/or of the movement means 38 may comprise a chain or a cable instead of the toothed belt described above, or any other type of transmission suitable for the purpose.

[0126] Instead of an electromagnet with selective activation, other means may be provided for selectively applying a magnetic force to the seat receiving the lids. A possible further embodiment of these means is shown,

for example, in Figure 14 in which there is a permanent magnet 53, preferably arranged beneath the receiving seat 36 and mounted on the basic structure 5 so as to move towards the seat at a predetermined stage of the operation of the apparatus 1. This stage starts when the lids, free of wrapping film, move from the cutting station 19 to the receiving seat 36 and ends when the thrust element 39 acts actively on the last lid, preventing the first and last lids from overturning.

[0127] According to an embodiment, the movement of the permanent magnet may be performed as a translational movement towards and away from the seat 36. The translational movement can be preferably vertical and the shape of the permanent magnet is similar to that of the electromagnet 52.

[0128] According to a further embodiment, the permanent magnet is mounted for rotating on the basic structure 5, eccentrically relative to the axis of rotation, or is fitted on only a portion of a rotating support. The rate of rotation is adjusted in a manner such that the minimum distance between the magnet and the seat 36, and hence the maximum attractive force exerted by the magnet on the lids, occurs during the above-mentioned stage.

[0129] In order to satisfy contingent and specific requirements, a person skilled in the art may apply to the above-described preferred embodiment of the apparatus many modifications, adaptations and replacements of elements with other functionally equivalent elements, without however departing from the scope of the appended claims. In particular, the transfer apparatus is suitable for use for packages of objects in general, provided that they are formed by means of a wrapping film which holds the packaged objects close together. This solution is applicable in particular for packages of axially symmetrical objects such as disks or the like, of a shape comparable with that of the above-described packages of lids.

[0130] Moreover, some of the solutions described above may be used independently on apparatuses of known type, to improve their performance. For example, the vertical loading surface may also be used in an apparatus of known type. The provision of a loading apparatus which is independent of the apparatus 1 may also be adopted independently of the structure of the cutting and moving means.

[0131] The solution of a double output with a thrust element that can be mounted so as to be movable reversibly in the two directions may also be applied to conventional apparatuses and/or to other apparatus in order to improve their adaptability and versatility in relation to the work stations immediately downstream.

[0132] Moreover, the provision of gravity movement means, possibly combined with selectively active magnetic means, or selectively active magnetic means, possibly combined with gravity movement means, may be used independently of the presence of means for cutting the wrapping film.

Claims

1. Transfer apparatus for transferring objects, in particular lids (4) arranged close together and constituting a group, the apparatus comprising a seat (36) for receiving the objects and movement means (38) for moving the objects along the seat, the movement means having a thrust element (39), **characterized by** anti-bouncing and anti-overturning means (51) for the objects in the seat (36), the anti-bouncing and anti-overturning means (51) operating by means of a magnetic force and being operatively connected to selective activation means so that the magnetic force is applied to the objects during a stage of movement to the seat (36) and remain active until the thrust element (39) comes into contact with the last of the objects.

2. Transfer apparatus according to claim 1 in which the anti-bouncing and anti-overturning means (51) comprise an electromagnet (52) which is mounted in a stationary manner relative to the seat (36) and is excited during the said stage.

3. Transfer apparatus according to claim 2 in which the electromagnet (52) is disposed below the seat (36) which houses the objects to be transferred.

4. Transfer apparatus according to claim 2 or claim 3 in which the electromagnet (52) has an elongate shape which extends along a longitudinal axis (BB) of the seat (36).

5. Transfer apparatus according to any one of claims 2 to 4 in which the electromagnet (52) is placed in contact with a wall (37) defining the seat (36), and has a wall (52a) having substantially the same shape as at least a portion of the wall (37) defining the seat (36).

6. Transfer apparatus according to claim 1 in which the anti-bouncing and anti-overturning means (51) comprise a permanent magnet (53) mounted on a basic structure (5) in a manner such as to move towards the seat (36) during the said stage.

7. Transfer apparatus according to claim 6 in which the permanent magnet (53) is arranged below the seat (36) for receiving the objects.

8. Transfer apparatus according to claim 6 or claim 7 in which the permanent magnet (53) is mounted slidably on the basic structure (5) so as to be movable towards and away from the seat (36), the said stage corresponding to the portion of the path of the magnet closest to the seat (36).

9. Transfer apparatus according to claim 6 or claim 7,

in which the permanent magnet (53) is mounted for rotating on the basic structure (5) eccentrically with respect to the axis of rotation, or is fitted on only a portion of a rotating support.

10. Transfer apparatus according to claim 9 in which the speed of rotation of the permanent magnet (53) is adjusted in a manner such that the minimum distance between the magnet and the seat (36) is reached during the said stage.

11. Transfer apparatus according to any one of the preceding claims in which the movement means (38) are means operating by thrust and by gravity in which the thrust element (39) is suitable for acting on the last of the objects of the group, with reference to the direction of transfer of the objects, the thrust element (39) being operatively associated with a counterweight (43) movable between a raised position and a lowered position during the stage of the exertion of the thrust on the objects.

12. Transfer apparatus according to claim 11 in which the thrust element (39) has a cross-section such as to fit the seat (36).

13. Transfer apparatus according to claim 11 or claim 12 in which the thrust element (39) is operatively associated with a slide (40) which in turn is slidable on a guide (41) and connected to the counterweight (43).

14. Transfer apparatus according to claim 13 in which the slide (40) is connected to the counterweight (43) by means of a flexible cable (44).

15. Transfer apparatus according to claim 14 in which the flexible cable (44) extends at least partially around a pulley (45), the portion of the cable (44) extending from the pulley (45) to the counterweight (43) being arranged vertically.

16. Transfer apparatus according to claim 13 in which the guide (41) is mounted on a basic structure (5) so as to be parallel to a longitudinal axis (BB) of the seat (36).

17. Transfer apparatus according to any one of claims 13 to 16 in which the thrust element (39) and the slide (40) are connected by a rigid rod (42).

18. Transfer apparatus according to claims 16 and 17 in which the rod (42) is arranged transverse the longitudinal axis (BB) of the seat (36).

19. Transfer apparatus according to any one of claims 11 to 18 in which a guide element (46) is provided for housing and guiding the counterweight (43) during its movement.

20. Transfer apparatus according to claim 19 in which the guide element (46) comprises a guide tube.

21. Transfer apparatus according to any one of claims 11 to 20 in which return means (47) are further provided for returning the counterweight from the lowered position to the raised position.

22. Transfer apparatus according to claim 21 in which the return means (47) comprise a toothed belt (48) operatively connected to the thrust element (39) and wound on transmission elements (49) of which one is operatively connected to a geared motor unit (50).

23. Transfer apparatus according to claim 21 or claim 22 in which the return means (47) further comprise sensor means for detecting the final position of the objects and bringing about the operation of the return means (47) in order to return the counterweight (39) to the raised position.

24. An apparatus (1) for removing a wrapping film (2) from packages (3) of objects, in particular of lids (4), comprising means (26) for cutting the wrapping film (2), the cutting means (26) being mounted on the apparatus (1) in a cutting station (19) disposed between a region (9) for the input of the packages (3) and a region (20) for the output of the objects free of the wrapping film (2), **characterized in that** it comprises a transfer apparatus according to any one of claims 1 to 23, arranged in the output region (20).

25. Apparatus (1) according to claim 24 in which the seat (36) receives the objects, from a cutting station (19).

26. Apparatus (1) according to claim 24 or claim 25 when depending on claims 11 to 23 in which the counterweight (43) is arranged on the side on which the output for the objects (4) is disposed.

27. Apparatus (1) according to any one of claims 24 to 26 in which the movement means (38) can equally well be mounted in a manner such as to direct the objects along the receiving seat (36) in one direction or in the opposite direction.

28. Apparatus (1) according to any one of claims 24 to 27 in which cutting means are provided (26) and comprise two cutting heads (27) associated, respectively, with a drive unit (30) for causing them to translate along an axis substantially parallel to a longitudinal axis (AA) of a package (3a) disposed in the cutting station (19), and in opposite directions.

29. Apparatus for applying a packaging film to a group of objects, in particular of lids (4), **characterized by**

comprising a transfer apparatus according to any one of claims 1 to 23, arranged in a region for the input of the objects to be packaged.

Patentansprüche

1. Übergabevorrichtung zum Übergeben von Gegenständen, besonders von Deckeln (4), die eng beieinander angeordnet sind und eine Gruppe bilden, wobei die Vorrichtung eine Auflage (36) zum Aufnehmen der Gegenstände und eine Bewegungseinrichtung (38) zum Bewegen der Gegenstände entlang der Auflage aufweist und die Bewegungseinrichtung ein Schubelement (39) besitzt, **gekennzeichnet durch** eine Rückprall- und Umkippschutzeinrichtung (51) für die Gegenstände auf der Auflage (36), wobei die Rückprall- und Umkippschutzeinrichtung (51) mit einer magnetischen Kraft arbeitet und mit einer Einrichtung für die gezielte Aktivierung operativ verbunden ist, damit während einer Phase der Bewegung zur Auflage (36) die magnetische Kraft auf die Gegenstände ausgeübt wird und so lange aktiv bleibt, bis das Schubelement (39) mit dem letzten der Gegenstände in Berührung kommt.

2. Übergabevorrichtung gemäß Anspruch 1, bei der die Rückprall- und Umkippschutzeinrichtung (51) einen Elektromagneten (52) aufweist, der relativ zur Auflage (36) ortsfest montiert ist und während der erwähnten Phase erregt wird.

3. Übergabevorrichtung gemäß Anspruch 2, bei welcher der Elektromagnet (52) unterhalb der Auflage (36) angeordnet ist, welche die zu übergebenden Gegenstände enthält.

4. Übergabevorrichtung gemäß Anspruch 2 oder Anspruch 3, bei welcher der Elektromagnet (52) eine längliche Form entlang einer Längsachse (BB) der Auflage (36) besitzt.

5. Übergabevorrichtung gemäß irgendeinem der Ansprüche 2 bis 4, bei welcher der Elektromagnet (52) so angeordnet ist, dass er eine die Auflage (36) definierende Wand (37) berührt, und eine Wand (52a) mit im Wesentlichen derselben Form wie mindestens ein Teil der Wand (37), welche die Auflage (36) definiert, besitzt.

6. Übergabevorrichtung gemäß Anspruch 1, bei welcher die Rückprall- und Umkippschutzeinrichtung (51) einen Dauermagneten (53) aufweist, der so auf einer Grundkonstruktion (5) montiert ist, dass er sich während der erwähnten Phase in Richtung der Auflage (36) bewegt.

7. Übergabevorrichtung gemäß Anspruch 6, bei welcher der Dauermagnet (53) unterhalb der Auflage (36) zum Aufnehmen der Gegenstände angeordnet ist.

8. Übergabevorrichtung gemäß Anspruch 6 oder Anspruch 7, bei welcher der Dauermagnet (53) auf der Grundkonstruktion (5) gleitfähig montiert ist, damit er sich in Richtung der Auflage (36) und von ihr fort bewegen kann, wobei die erwähnte Phase dem Teil des Weges des Magneten entspricht, der der Auflage (36) am nächsten ist.

9. Übergabevorrichtung gemäß Anspruch 6 oder Anspruch 7, bei welcher der Dauermagnet (53) zum exzentrischen Drehen auf der Grundkonstruktion (5) in Bezug auf die Drehachse montiert oder nur an einem Teil einer drehenden Stütze befestigt ist.

10. Übergabevorrichtung gemäß Anspruch 9, bei der die Drehzahl des Dauermagneten (53) so angepasst wird, dass der Mindestabstand zwischen dem Magneten und der Auflage (36) während der erwähnten Phase erreicht wird.

11. Übergabevorrichtung gemäß irgendeinem der vorgenannten Ansprüche, bei der die Bewegungseinrichtung (38) eine Einrichtung ist, die mit Schub und mit Schwerkraft arbeitet, in der das Schubelement (39) dazu geeignet ist, auf den letzten der Gegenstände der Gruppe in Bezug auf die Richtung zu wirken, in der die Gegenstände übergeben werden, wobei das Schubelement (39) mit einem Gegengewicht (43) operativ verbunden ist, das sich während der Phase, in welcher der Schub auf die Gegenstände ausgeübt wird, zwischen einer angehobenen Stellung und einer abgesenkten Stellung bewegen kann.

12. Übergabevorrichtung gemäß Anspruch 11, bei der das Schubelement (39) einen Querschnitt dergestalt hat, dass es in die Auflage (36) passt.

13. Übergabevorrichtung gemäß Anspruch 11 oder Anspruch 12, bei der das Schubelement (39) mit einem Gleitstück (40) operativ verbunden, das seinerseits auf einer Führung (41) gleitfähig und mit dem Gegengewicht (43) verbunden ist.

14. Übergabevorrichtung gemäß Anspruch 13, bei der das Gleitstück (40) mittels eines flexiblen Kabels (44) mit dem Gegengewicht (43) verbunden ist.

15. Übergabevorrichtung gemäß Anspruch 14, bei der das flexible Kabel (44) sich mindestens teilweise um eine Scheibe (45) erstreckt, wobei der Teil des Kabels (44), der sich von der Scheibe (45) zum Gegengewicht (43) erstreckt, senkrecht verläuft.

16. Übergabevorrichtung gemäß Anspruch 13, bei der

die Führung (41) so auf einer Grundkonstruktion (5) montiert ist, dass sie parallel zu einer Längsachse (BB) der Auflage (36) verläuft.

17. Übergabevorrichtung gemäß irgendeinem der Ansprüche 13 bis 16, bei der das Schubelement (39) und das Gleitstück (40) über einen starren Stab (42) verbunden sind.

18. Übergabevorrichtung gemäß den Ansprüchen 16 und 17, bei welcher der Stab (42) quer zur Längsachse (BB) der Auflage (36) angeordnet ist.

19. Übergabevorrichtung gemäß irgendeinem der Ansprüche 11 bis 18, bei der ein Führungselement (46) zum Aufnehmen und Führen des Gegengewichts (43) während seiner Bewegung vorgesehen ist.

20. Übergabevorrichtung gemäß Anspruch 19, bei der das Führungselement (46) ein Führungsrohr aufweist.

21. Übergabevorrichtung gemäß irgendeinem der Ansprüche 11 bis 20, bei der außerdem eine Rückstelleinrichtung (47) vorgesehen ist, um das Gegengewicht von der abgesenkten Stellung wieder in die angehobene Stellung zu bringen.

22. Übergabevorrichtung gemäß Anspruch 21, bei der die Rückstelleinrichtung (47) einen Zahnriemen (48) aufweist, der mit dem Schubelement (39) operativ verbunden ist und um Übertragungselemente (49) gelegt ist, von denen eines mit einer Getriebemotoreinheit (50) operativ verbunden ist.

23. Übergabevorrichtung gemäß Anspruch 21 oder Anspruch 22, bei der die Rückstelleinrichtung (47) außerdem eine Sensoreinrichtung zum Erfassen der Endstellung der Gegenstände und zum Herbeiführen des Betriebes der Rückstelleinrichtung (47) mit dem Ziel, das Gegengewicht (39) wieder in die angehobene Stellung zu bringen, aufweist.

24. Eine Vorrichtung (1) zum Entfernen einer Verpakkungsfolie (2) von Packungen (3) von Gegenständen, besonders von Deckeln (4), die eine Einrichtung (26) zum Schneiden der Verpackungsfolie (2) aufweist, wobei die Schneideinrichtung (26) an der Vorrichtung (1) in einer Schneidestation (19) montiert ist, die zwischen einem Bereich (9) für das Aufgeben der Packungen (3) und einem Bereich (20) für das Ausgeben der von der Verpakkungsfolie (2) freien Gegenstände angeordnet ist, **dadurch gekennzeichnet, dass** sie eine Übergabevorrichtung gemäß irgendeinem der Ansprüche 1 bis 23 aufweist, die im Ausgabebereich (20) angeordnet ist.

25. Vorrichtung (1) gemäß Anspruch 24, bei der die Auflage (36) die Gegenstände von einer Schneidestation (19) aufnimmt.

26. Vorrichtung (1) gemäß Anspruch 24 oder Anspruch 25, wenn von den Ansprüchen 11 bis 23 abhängig, bei der das Gegengewicht (43) auf der Seite angeordnet ist, auf der die Ausgabe für die Gegenstände (4) angeordnet ist.

27. Vorrichtung (1) gemäß irgendeinem der Ansprüche 24 bis 26, bei der die Bewegungseinrichtung (38) gleichermaßen gut in einer Weise montiert werden kann, dass sie die Gegenstände entlang der aufnehmenden Auflage (36) in die eine oder in die Gegenrichtung lenkt.

28. Vorrichtung (1) gemäß irgendeinem der Ansprüche 24 bis 27, bei der eine Schneideinrichtung (26) vorgesehen ist, die zwei Schneidköpfe (27) aufweist, die jeweils mit einer Antriebseinheit (30) verbunden sind, um sie entlang einer Achse, die im Wesentlichen parallel zu einer Längsachse (AA) einer in der Schneidestation (19) befindlichen Packung (3a) verläuft, und in entgegengesetzte Richtungen zu verfahren.

29. Vorrichtung zum Aufbringen einer Verpackungsfolie auf eine Gruppe von Gegenständen, besonders von Deckeln (4), **dadurch gekennzeichnet, dass** sie eine Übergabevorrichtung gemäß irgendeinem der Ansprüche 1 bis 23 aufweist, die in einem Bereich für die Aufgabe der zu verpackenden Gegenstände angeordnet ist.

Revendications

1. Appareil de transfert pour transférer des objets, dans des couvercles particuliers (4), disposés près l'un de l'autre et constituant un groupe, l'appareil comprenant un siège (36) pour recevoir les objets et des moyens de mouvement (38) pour déplacer les objets le long du siège, les moyens de mouvement ayant un élément de poussée (39), **caractérisé par** des moyens anti-rebond et anti-renversement (51) pour les objets dans le siège (36), les moyens anti-rebond et anti-renversement (51) fonctionnant au moyen d'une force magnétique et étant connectés de manière opérationnelle à des moyens d'activation sélectifs, de sorte que la force magnétique soit appliquée aux objets pendant une phase de mouvement vers le siège (36) et reste active jusqu'à ce que l'élément de poussée (39) vienne en contact avec le dernier des objets.

2. Appareil de transfert selon la revendication 1 dans lequel les moyens anti-rebond et anti-renversement (51) comprennent un électro-aimant (52) qui est

monté de manière stationnaire relativement au siège (36) et est excité pendant ladite phase.

3. Appareil de transfert selon la revendication 2, dans lequel l'électro-aimant (52) est disposé sous le siège (36) qui abrite les objets à transférer.

4. Appareil de transfert selon la revendication 2 ou la revendication 3 dans lequel l'électro-aimant (52) a une forme allongée qui s'étend le long d'un axe longitudinal (BB) du siège (36).

5. Appareil de transfert selon l'une quelconque des revendications 2 à 4, dans lequel l'électro-aimant (52) est placé en contact avec une paroi (37) définissant le siège (36), et a une paroi (52a) ayant sensiblement la même forme qu'au moins une portion de la paroi (37) définissant le siège (36).

6. Appareil de transfert selon la revendication 1, dans lequel les moyens anti-rebonds et anti-renversement (51) comprennent un aimant permanent (53) monté sur une structure de base (5) de manière à déplacer vers le siège (36) pendant ladite phase.

7. Appareil de transfert selon la revendication 6, dans lequel l'aimant permanent (53) est disposé sous le siège (36) pour recevoir les objets.

8. Appareil de transfert selon la revendication 6, ou la revendication 7, dans lequel l'aimant permanent (53) est monté en coulissement sur la structure de base (5) de façon à se déplacer vers et loin du siège (36), ladite phase correspondant à la portion de la voie de l'aimant la plus proche du siège (36).

9. Appareil de transfert selon la revendication 6 ou la revendication 7, dans lequel l'aimant permanent (53) est monté pour tourner sur la structure de base (5) de manière excentrique par rapport à l'axe de rotation, ou est fourni sur seulement une portion d'un support de rotation.

10. Appareil de transfert selon la revendication 9, dans lequel la vitesse de rotation de l'aimant permanent (53) est ajustée de manière telle que la distance minimum entre l'aimant et le siège (36) est atteinte pendant ladite phase.

11. Appareil de transfert selon l'une quelconque des revendications précédentes, dans lequel les moyens de mouvement (38) sont des moyens actionnés par poussée et par gravité, dans lequel l'élément de poussée (39) est adapté pour agir sur le dernier des objets du groupe, en se référant à la direction de transfert des objets, l'élément de poussée (39) étant associé de manière opérationnelle à un contrepoids (43) mobile entre une position surélevée et une position abaissée pendant la phase d'exercice de la poussée sur les objets.

12. Appareil de transfert selon la revendication 11, dans lequel l'élément de poussée (39) a une section transversale de façon à adapter le siège (36).

13. Appareil de transfert selon la revendication 11 ou la revendication 12, dans lequel l'élément de poussée (39) est associé de manière opérationnelle avec une coulisse (40) qui, à son tour, est coulissable sur un guide (41) et est reliée au contrepoids (43).

14. Appareil de transfert selon la revendication 13 dans lequel la coulisse (40) est reliée au contrepoids (43) au moyen d'un câble flexible (44).

15. Appareil de transfert selon la revendication 14, dans lequel le câble flexible (44) s'étend au moins partiellement autour d'une poulie (45), la portion du câble (44) s'étendant depuis la poulie (45) jusqu'au contrepoids (43) disposé verticalement.

16. Appareil de transfert selon la revendication 13, dans lequel le guide (41) est monté sur une structure de base (5) de façon à être parallèle à un axe longitudinal (BB) du siège (36).

17. Appareil de transfert selon l'une quelconque des revendications 13 à 16, dans lequel l'élément de poussée (39) et la coulisse (40) sont connectés par une tige rigide (42).

18. Appareil de transfert selon les revendications 16 et 17, dans lequel la tige (42) est disposée transversalement à l'axe longitudinal (BB) du siège (36).

19. Appareil de transfert selon l'une quelconque des revendications 11 à 18, dans lequel un élément de guidage (46) est fourni pour abriter et guider le contrepoids (43) pendant son mouvement.

20. Appareil de transfert selon la revendication 19 dans lequel l'élément de guidage (46) comprend un tube de guidage.

21. Appareil de transfert selon l'une quelconque des revendications 11 à 20, dans lequel des moyens de retour (47) sont ultérieurement fournis pour renvoyer le contrepoids de la position abaissée à la position surélevée.

22. Appareil de transfert selon la revendication 21, dans lequel les moyens de retour (47) comprennent une courroie dentée (48) connectée opérationnellement à l'élément de poussée (39) et enroulée sur les éléments de transmission (49), dont un élément est relié de manière opérationnelle à une unité de moteur à

engrenage (50).

23. Appareil de transfert selon la revendication 21 ou 22, dans lequel les moyens de retour (47) comprennent en outre des moyens de détecteur pour détecter la position finale des objets et permettre le fonctionnement des moyens de retour (47) afin de renvoyer le contrepoids (39) dans la position surélevée.

24. Appareil (1) pour enlever un film d'emballage (2) d'emballages (3) d'objets, en particulier de couvercles (4), comprenant des moyens (26) pour couper le film d'emballage (2), les moyens de découpe (26) étant montés sur l'appareil (1) dans une station de découpe (19) disposée entre une zone (9) pour l'entrée de paquets (3) et une zone (20) pour la sortie des objets sans film d'emballage (2), **caractérisé en ce qu'**il comprend un appareil de transfert selon l'une quelconque des revendications 1 à 23, disposé dans la zone de sortie (20).

25. Appareil (1) selon la revendication 24, dans lequel le siège (36) reçoit les objets, depuis une station de découpe (19).

26. Appareil (1) selon la revendication 24 ou la revendication 25, dépendant des revendications 11 à 23, dans lequel le contrepoids (43) est disposé sur le côté sur lequel la sortie des objets est disposée.

27. Appareil (1) selon l'une quelconque des revendications 24 à 26, dans lequel les moyens de mouvement (38) peuvent également être bien montés de manière à diriger les objets le long du siège de réception (36) dans une direction ou dans la direction opposée.

28. Appareil (1) selon l'une quelconque des revendications 24 à 27, dans lequel des moyens de coupe sont fournis (26) et comprennent deux têtes de coupe (27) associées, respectivement, à une unité de commande (30) pour provoquer la translation le long d'un axe sensiblement parallèle à un axe longitudinal (AA) d'un paquet (3a) disposé dans la station de coupe (19), et dans des directions opposées.

29. Appareil pour appliquer un film d'emballage à un groupe d'objets, en particulier de couvercles (4), **caractérisé en ce qu'**il comprend un appareil de transfert selon l'une quelconque des revendications 1 à 23, disposé dans une zone pour l'entrée des objets à emballer.

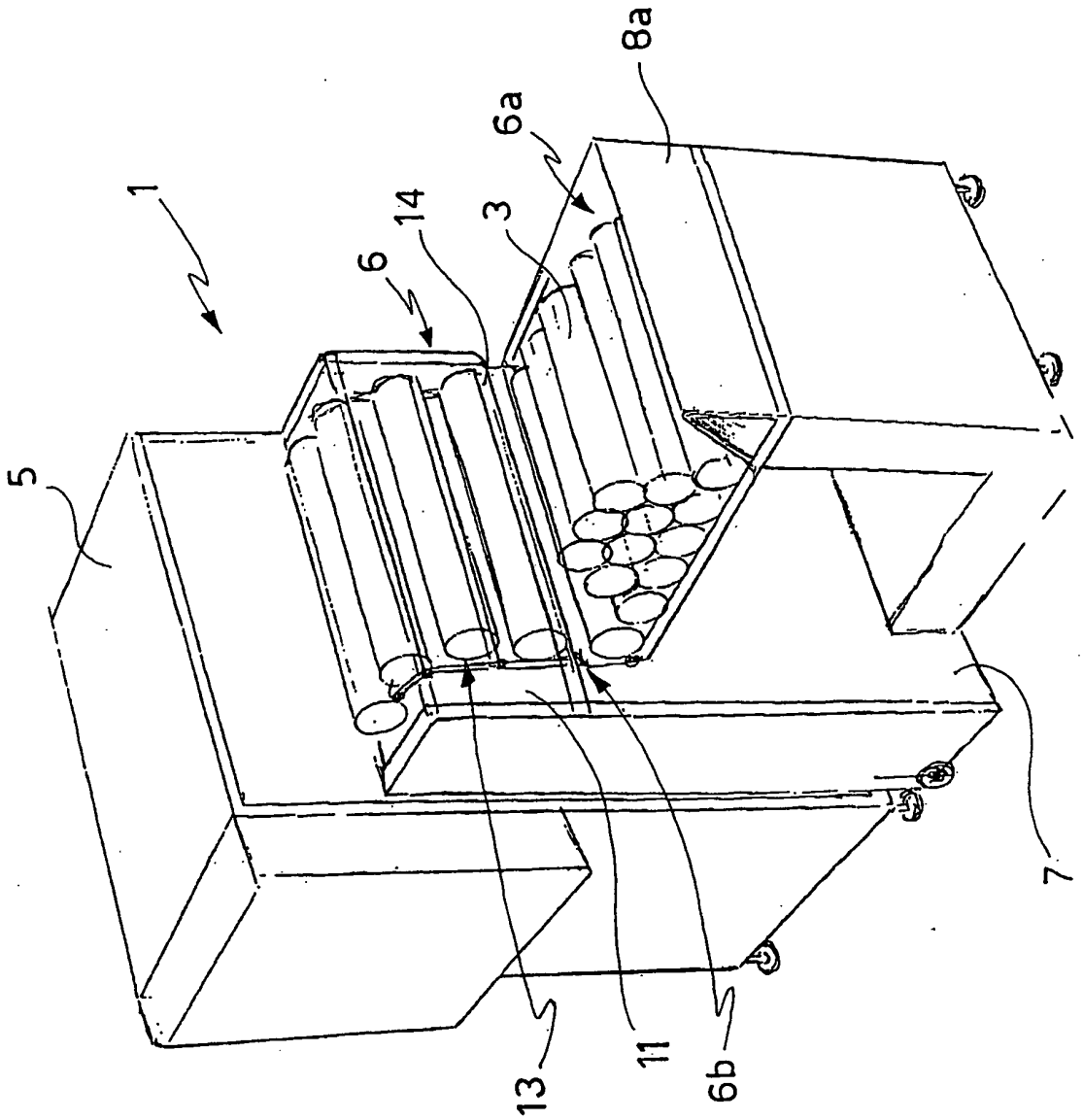


FIG.1

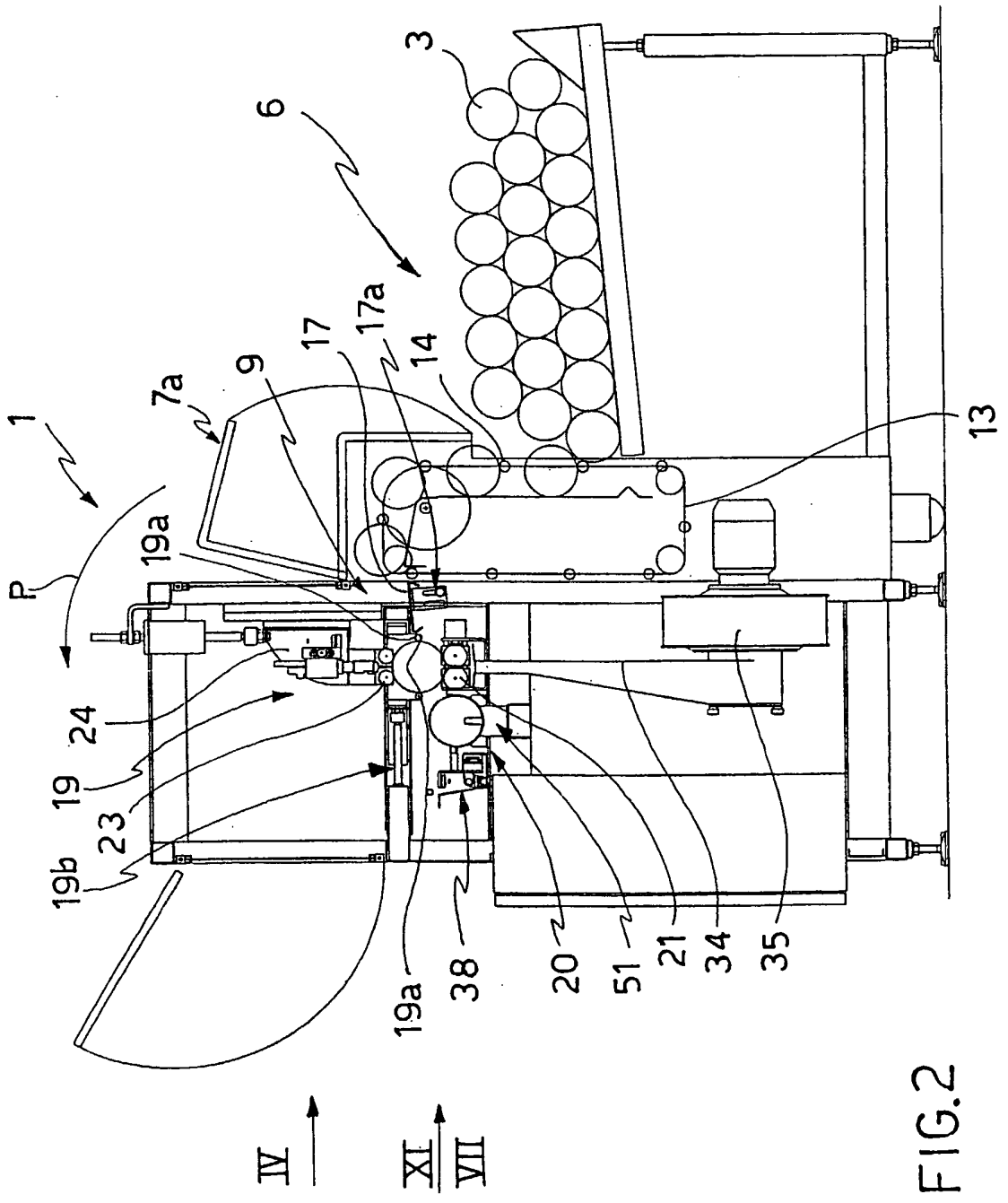


FIG.2

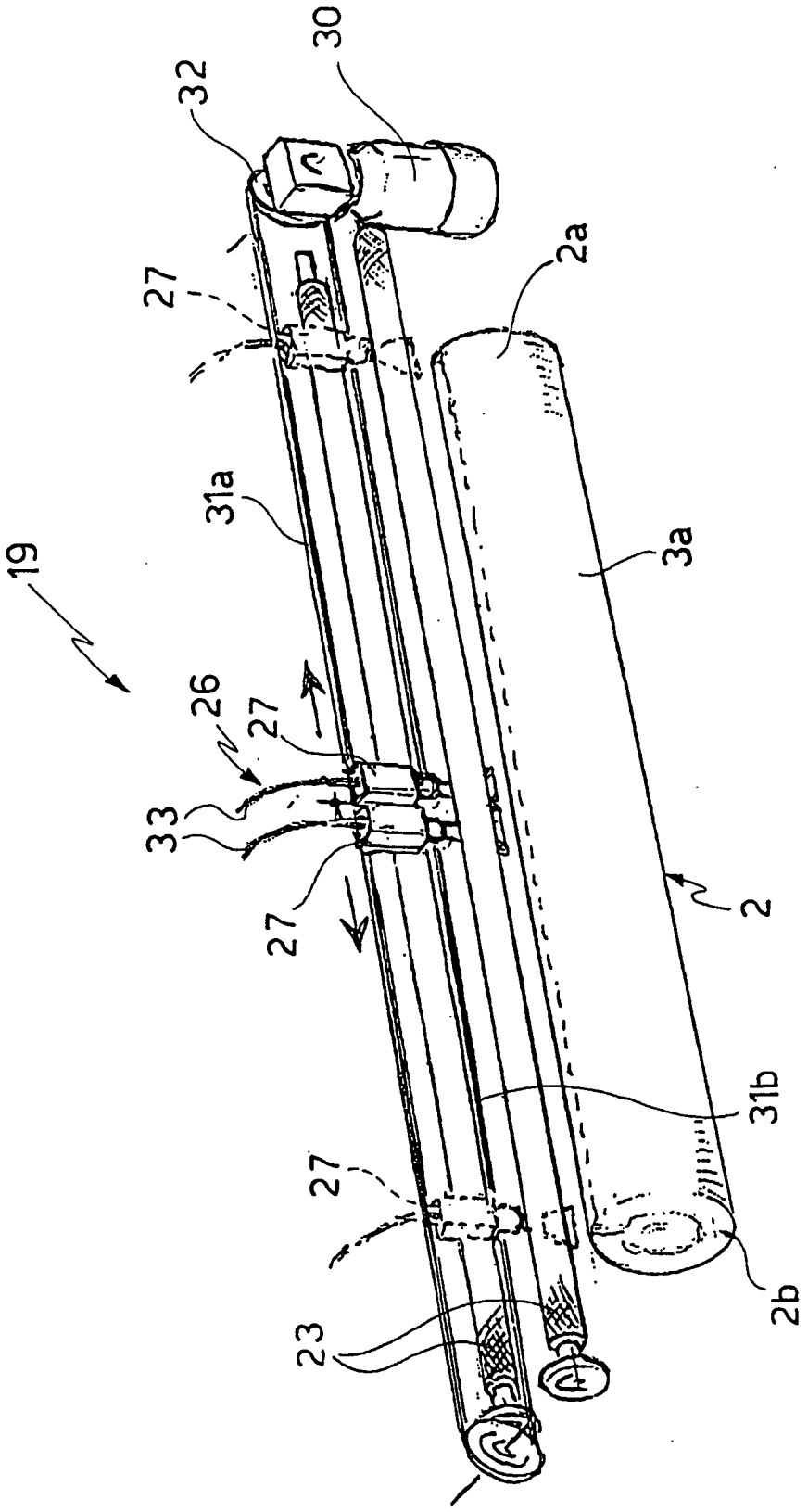


FIG. 3

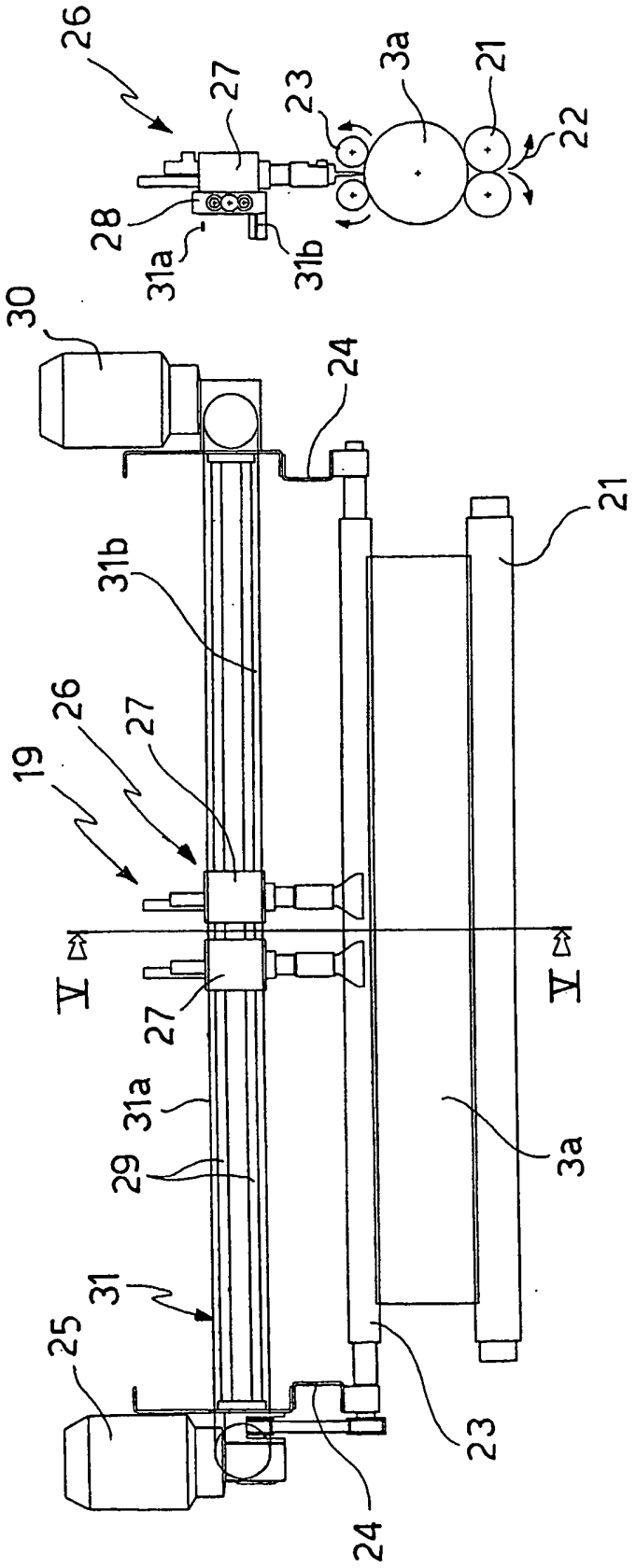

26
27
23
3a
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22
28
31a
31b
30
24
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24

FIG. 5

FIG. 4

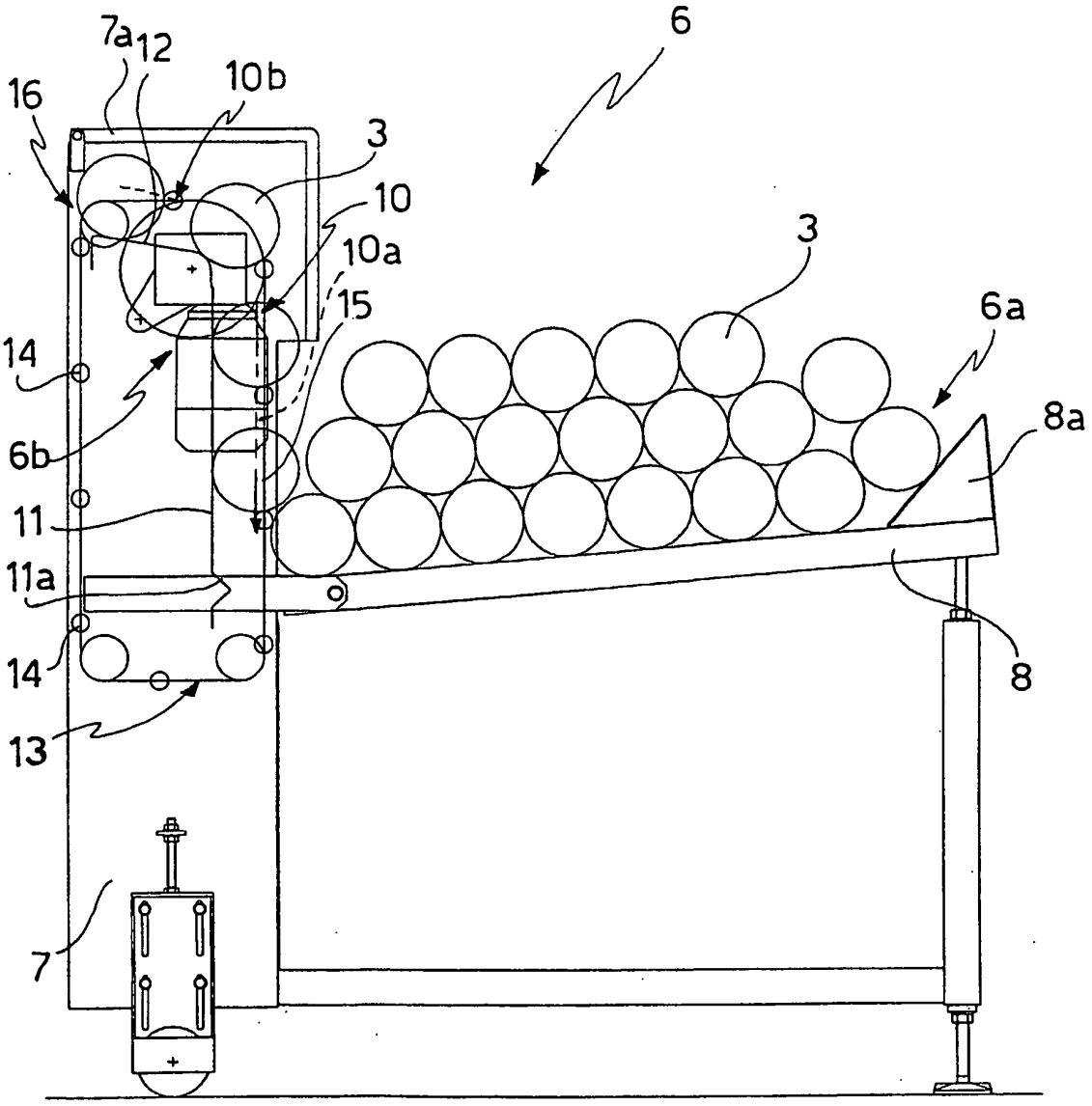


FIG. 6

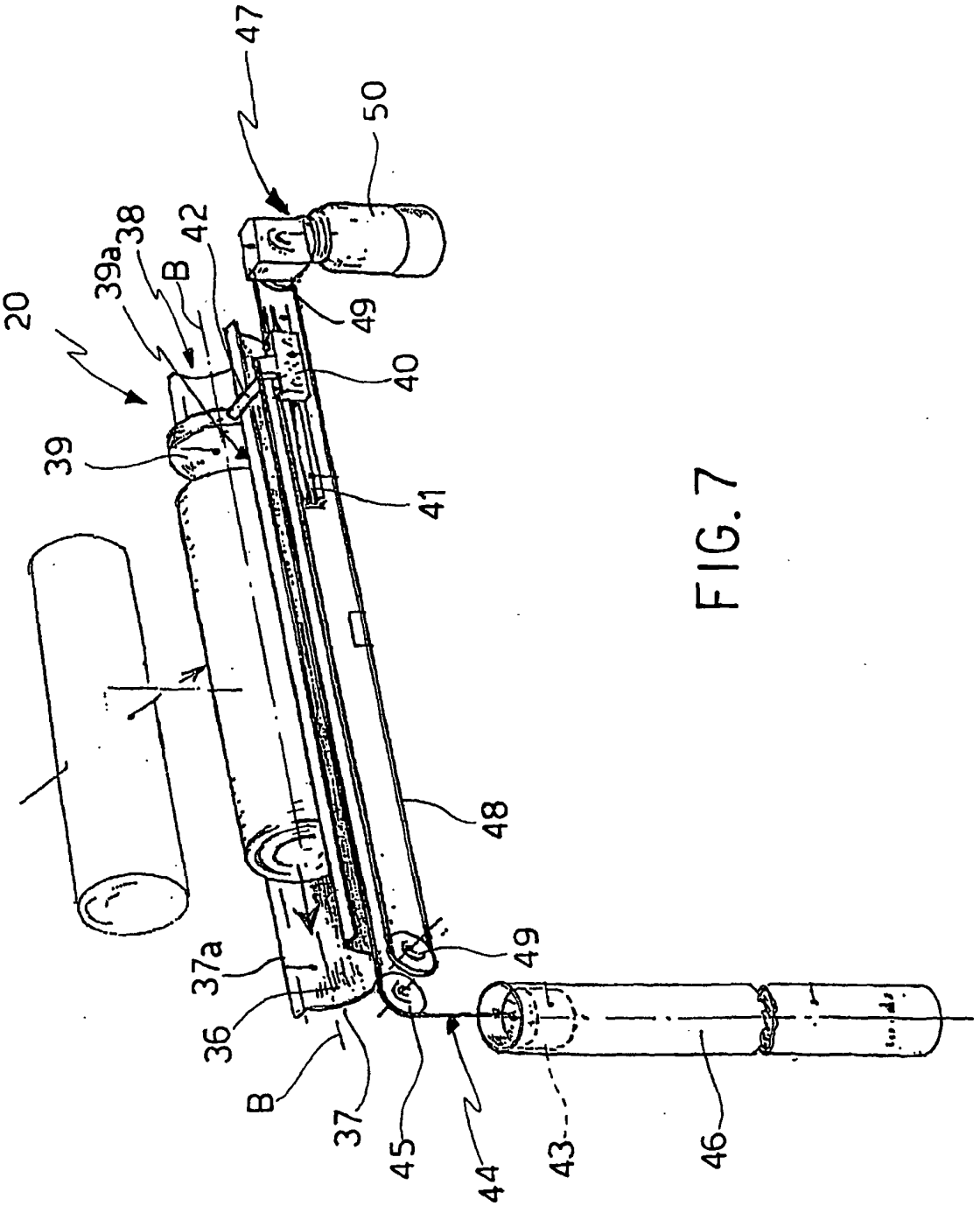


FIG. 7

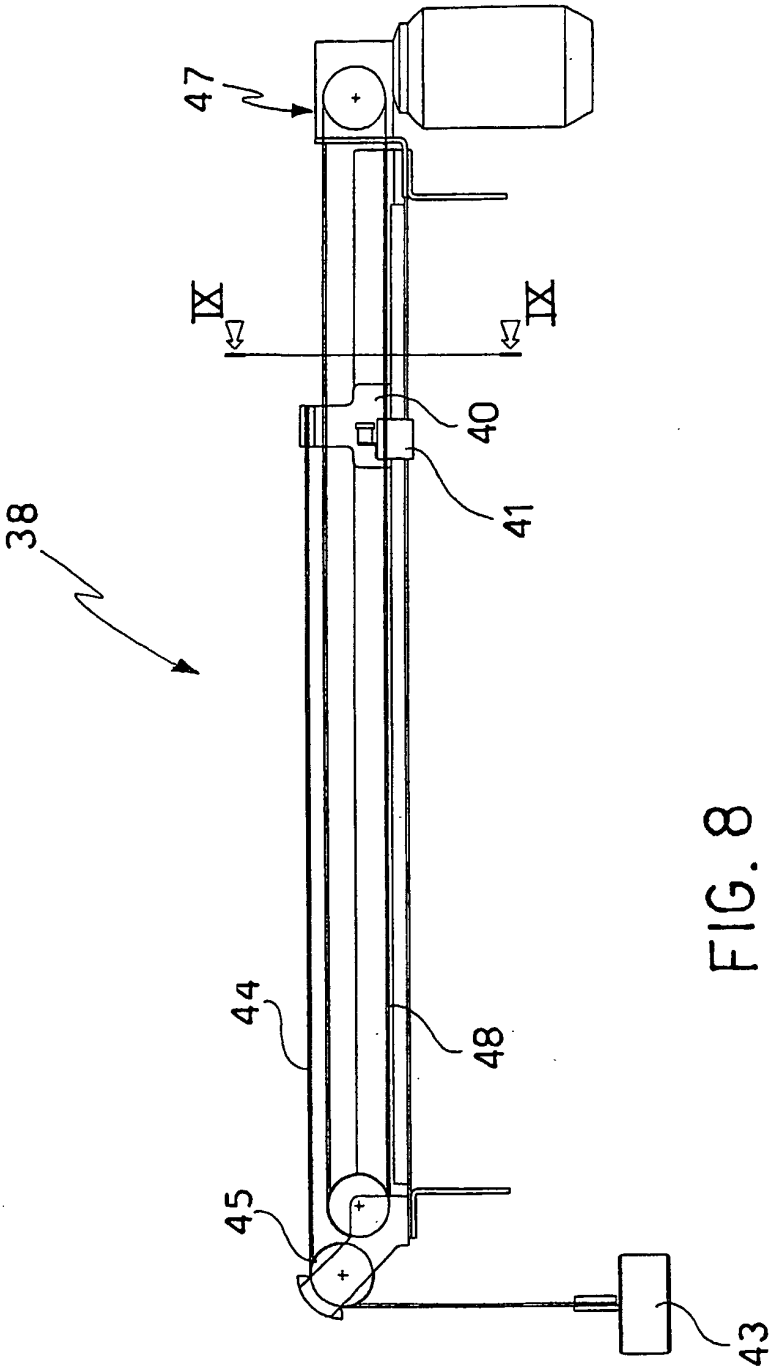


FIG. 8

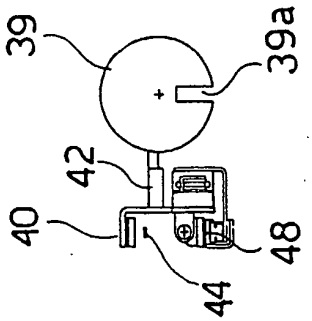


FIG. 9

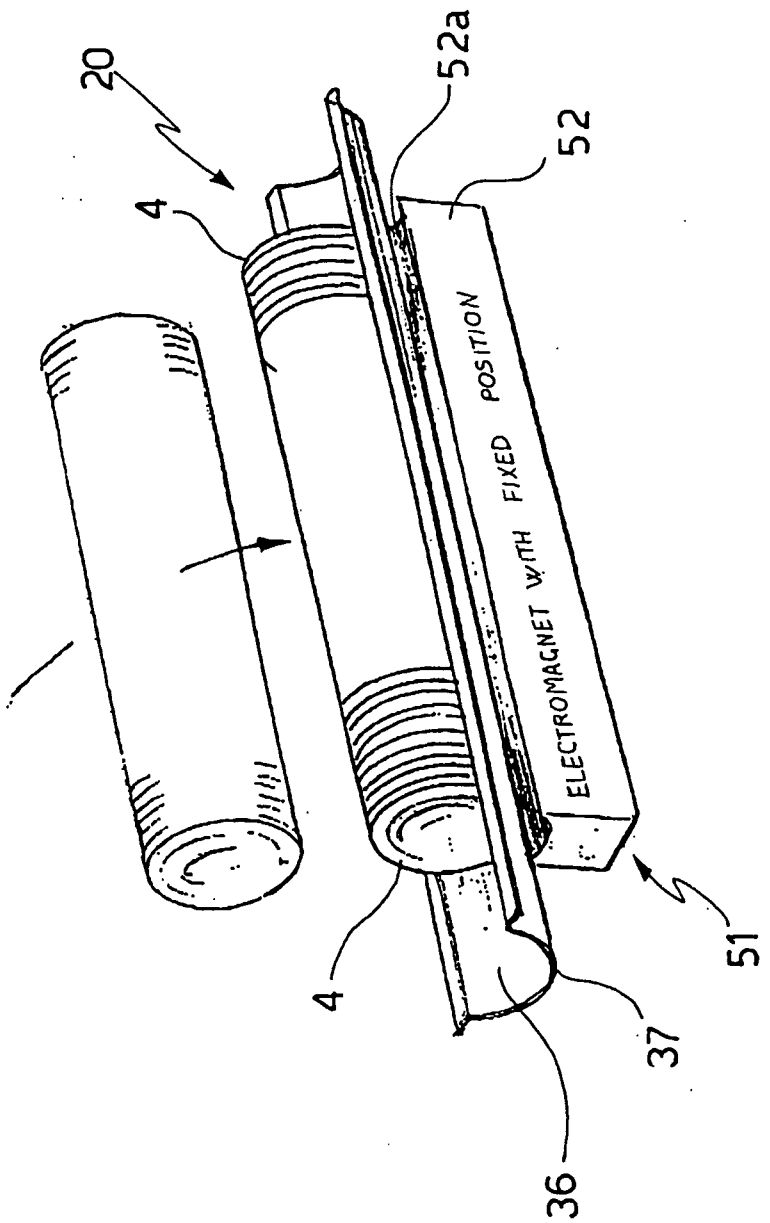


FIG.10

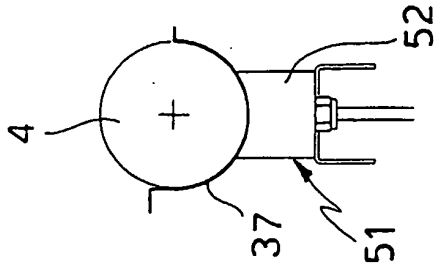


FIG. 12

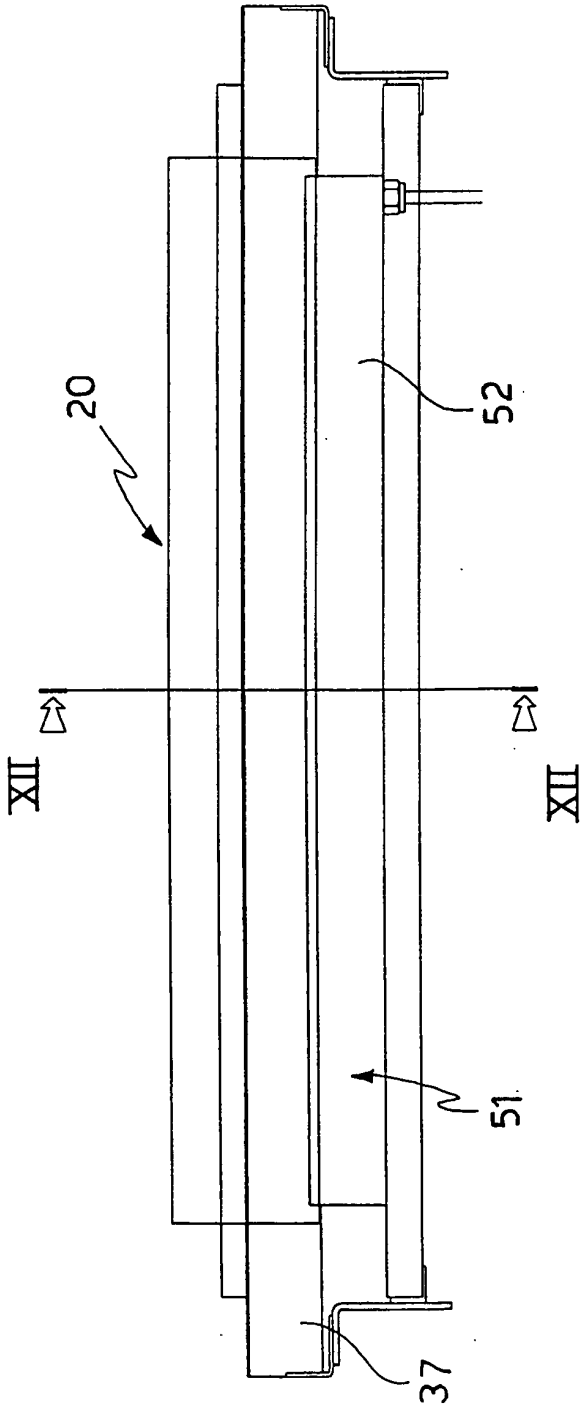


FIG. 11

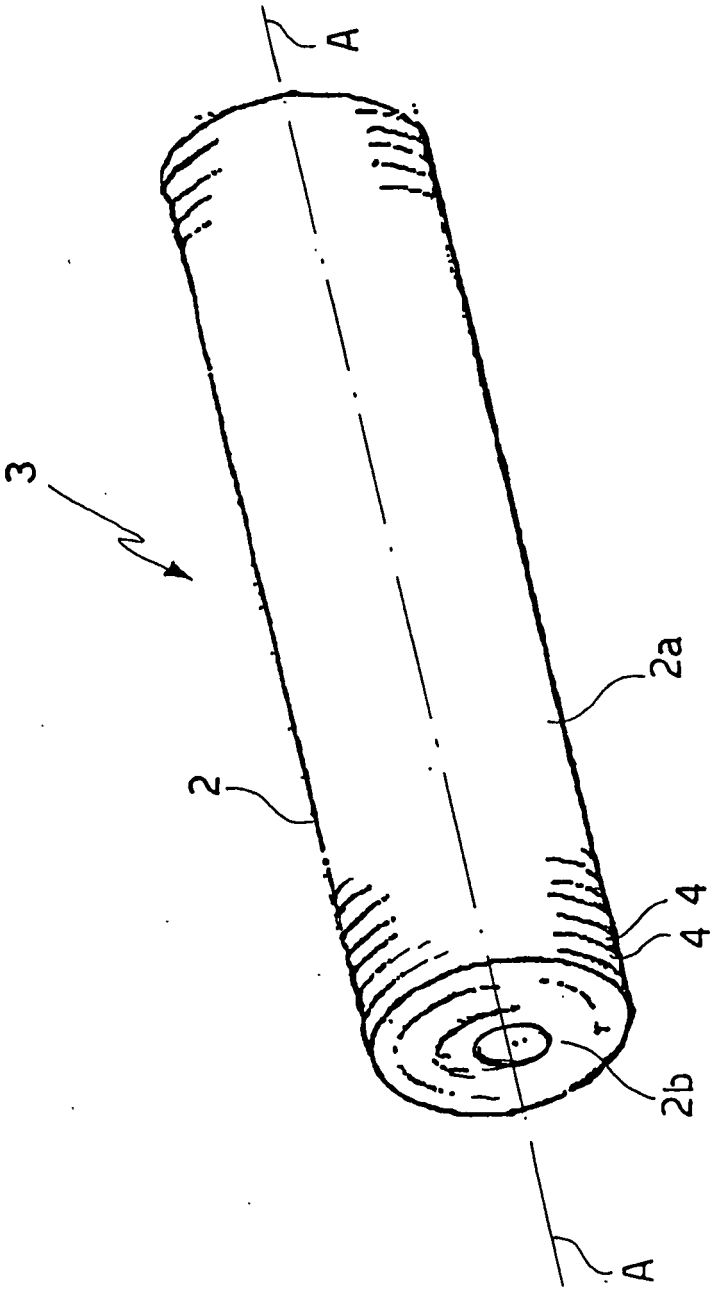


FIG.13

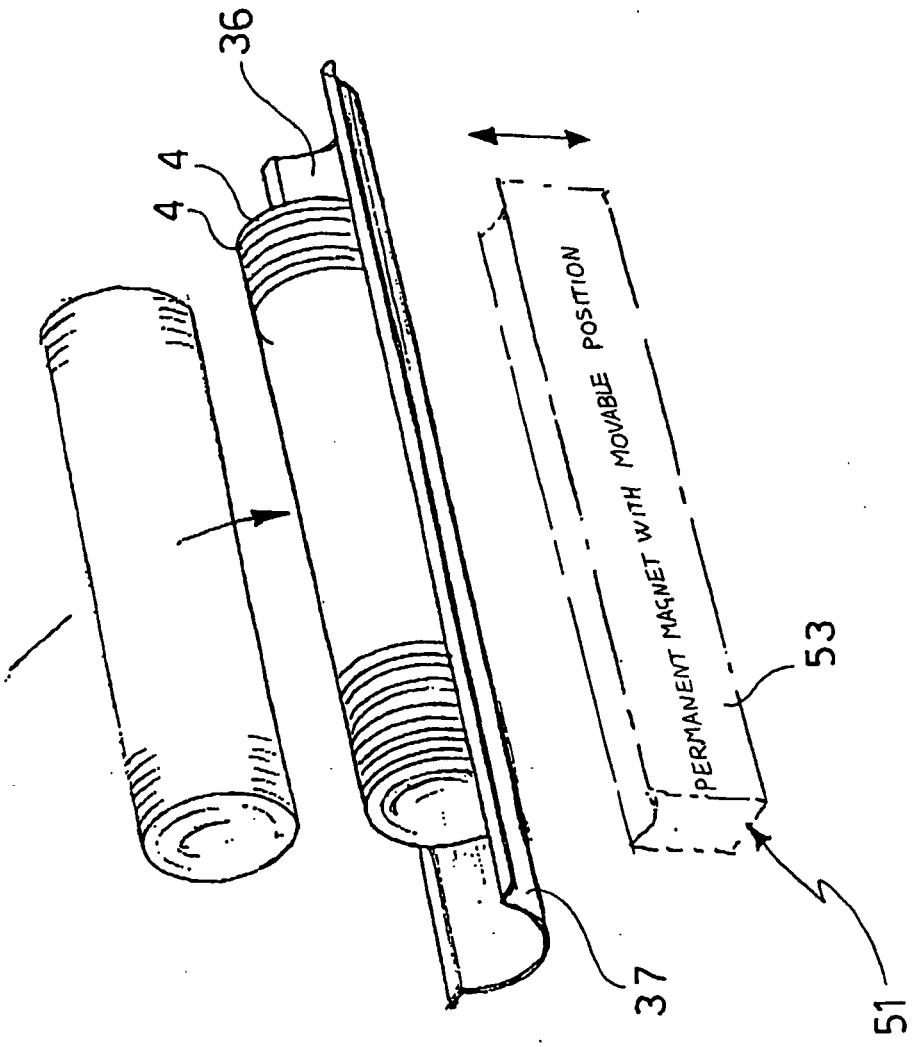


FIG.14