(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 532 050 B2**

(12) **NEW EUROPEAN PATENT SPECIFICATION**
After opposition procedure

(45) Date of publication and mention of the opposition decision:
16.11.2011 Bulletin 2011/46

(45) Mention of the grant of the patent:
20.06.2007 Bulletin 2007/25

(21) Application number: **02733215.4**

(22) Date of filing: **23.04.2002**

(51) Int Cl.:
B65B 69/00 *(2006.01)*

(86) International application number:
PCT/IT2002/000266

(87) International publication number:
WO 2003/091115 (06.11.2003 Gazette 2003/45)

(54) APPARATUS AND METHOD FOR REMOVING THE WRAPPING FILM FROM A PACKAGE OF OBJECTS, IN PARTICULAR OF LIDS

VORRICHTUNG UND VERFAHREN ZUM ENTFERNEN DER UMHÜLLUNGSFOLIE EINER PACKUNG VON ARTIKELN, INSBESONDERE VON DECKELN

APPAREIL ET PROCEDE DE RETRAIT D'UNE PELLICULE DE CONDITIONNEMENT D'UN EMBALLAGE D'OBJETS NOTAMMENT DE COUVERCLES

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(43) Date of publication of application:
25.05.2005 Bulletin 2005/21

(73) Proprietor: **Techno Italy S.R.L.**
44100 Ferrara (IT)

(72) Inventors:
- **BORRA, Giacomo,**
  Techno Italy S.r.l.
  I-44100 Ferrara (IT)
- **BENINI, Gianni,**
  Techno Italy S.r.l.
  I-44100 Ferrara (IT)

(74) Representative: **Fuochi, Riccardo**
APTA S.r.l.
Piazza dei Martiri, 1
40121 Bologna BO (IT)

(56) References cited:
EP-A- 0 947 428
GB-A- 2 105 288
US-A- 4 285 625
US-A- 4 344 268
US-A- 4 997 329

EP 1 532 050 B2

Description

[0001] The subject of the present invention is an apparatus and a method for removing a wrapping film from packages of objects or products.

[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.

[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 cutting of the wrapping film, which is difficult in particular in the portions of the film which are folded over the ends of the pack, owing both to the greater strength and to the positions of these portions, substantially at 90° to the remaining portion of the film.

[0016] Furthermore, an apparatus in accordance with the preamble of claim 1 is known from US-A-4 344 268, also a machine with a single cutting head is known on the market with the name TM 800 by the company Tecno Machinery s.r.l.

[0017] The problem underlying the present invention is to propose an apparatus and a method for removing a wrapping film from packages of objects, in particular lids, which has structural and functional characteristics such as to satisfy the above-mentioned needs and, at the same time, to overcome the problems mentioned with reference to the prior art.

[0018] This problem is solved by apparatus for removing a wrapping film from packages of objects, in particular lids, according to Claim 1 and by a method of removing a wrapping film from packages of objects, in particular lids, according to Claim 21.

[0019] 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, 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 in-

vention,

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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] 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).

[0028] 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.

[0029] 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.

[0030] 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.

[0031] 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.

[0032] Along the path 10, the packages 3 are arranged with their longitudinal axes parallel to one another and transverse the path followed.

[0033] 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.

[0034] 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.

[0035] 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) .

[0036] 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.

[0037] 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.

[0038] 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.

[0039] 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.

[0040] 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.

[0041] 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.

[0042] 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.

[0043] 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.

[0044] 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.

[0045] According to one possible embodiment, the input region 9 comprises a surface 17 for the sliding of the packages 3. According to one possible embodiment, the ends of the surface 17 are 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.

[0046] 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).

[0047] 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.

[0048] 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.

[0049] 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.

[0050] 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.

[0051] 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.

[0052] 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.

[0053] 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.

[0054] 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. According to one possible embodiment, the two pressure rollers 23 are disposed a predetermined distance apart (Figures 2 and 5).

[0055] According to one possible embodiment, the pressure rollers 23 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.

[0056] 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.

[0057] The cutting station 19 also comprises cutting means 26 which operate on the wrapping film 2.

[0058] 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).

[0059] 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.

[0060] 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. According to one possible embodiment, the two carriages 28 are advantageously operatively connected to the same drive unit 30 which moves them simultaneously in the two opposite directions.

[0061] 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.

[0062] 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.

[0063] 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.

[0064] According to one advantageous 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).

[0065] 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.

[0066] 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.

[0067] The drive unit 30 of the carriages 28, and hence of the cutting heads 27, may advantageously 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.

[0068] 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.

[0069] 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).

[0070] 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.

[0071] According to the present invention, the cutting of the wrapping film of a package 3 of objects, in particular lids 4, advantageously takes place in accordance with a method which provides 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. The method described above advantageously provides for the cutting step to 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] According to one possible embodiment of the method of cutting of a wrapping film of packages, the step of the cutting of the lateral portion 2a of the film may advantageously 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] In addition to the steps mentioned above, 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. According to one possible embodiment, 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. In the embodiment shown, 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] According to one possible embodiment, the wall 37 does 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 advantageously 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 advantageously 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, 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 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 of the present invention enables 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 pf 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.

[0123] Naturally, variations and/or additions may be provided for the embodiments described and illustrated above.

[0124] 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.

[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 a first embodiment, the movement of the permanent magnet may be performed as a trans-

lational movement towards and away from the seat 36. According to one possible embodiment, the translational movement is preferably vertical and the shape of the permanent magnet is similar to that of the electromagnet 52.

[0128] According to a second 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 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, but may be applied to lids of any shape and to any package, even of a single, preferably elongate, product.

[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. An apparatus (1) for removing a wrapping film (2) from packages (3) of objects, in particular of lids (4), the packages having a longitudinal axis (AA), the apparatus 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 (4) free of the wrapping film (2), and said cutting means (26) comprise two cutting heads (27) mounted so as to be movable relative to the apparatus (1) along an axis substantially parallel to the longitudinal axis (AA) of a package (3a) disposed in the cutting station (19),**characterized in that**:

   - the apparatus comprises a loading apparatus (6);
   - the region (9) for the input receives the packages (3) from the loading apparatus (6) along a path (10) perpendicular to the longitudinal axes (AA) of the packages;
   - the cutting station (19) receives the packages (3) from the region (9) for the input along a path (P) perpendicular to the longitudinal axes (AA) of the packages;
   - the region for the output (20) receives the packages from the cutting station (19) along a path (P) perpendicular to the longitudinal axes (AA) of the packages and comprises a receiving seat (36) comprising a wall (37) mounted on a basic structure (5) of the apparatus (1) and defining an output channel which extends along a longitudinal axis (BB) that is perpendicular to the path followed by the packages (3) from the input region (9) to the output region (20), and
   - each cutting head (27) is formed by a nozzle (32) connected by means of tubes (33) to a source of heated fluid,

   wherein the two cutting heads (27) are associated, respectively, with a drive unit (30) for causing them to translate along an axis substantially parallel to a longitudinal axis (AA) of the package (3a) disposed in the cutting station (19), and in opposite directions, and wherein each of the two cutting heads (27) translates from a central position to a position at the end of the package (3a) positioned in the cutting station (19).

2. An apparatus (1) according to Claim 1 in which the two cutting heads (27) are operatively connected to the same drive unit (30) which brings about their simultaneous translation in the two opposite directions.

3. An apparatus (1) according to any one of the preceding claims in which the translational movement of the cutting heads (27) is interrupted in the region of the end portions of the package in order to cut the end portion (2b) of the wrapping film (2).

4. An apparatus (1) according to Claim 2 in which the drive unit (30) comprises a belt (31) which can travel over transmission elements (32) which define, in the belt (31), at least a first portion (31a) and a second

portion (31b) which move in substantially opposite directions, one cutting head (27) being connected to one of the belt portions in order to move in the opposite direction to the other cutting head which in turn is connected to the other of the two belt portions.

5. An apparatus (1) according to Claim 4 in which the belt (31) is wound on two transmission elements (32), the first and second portions (31a, 31b) being arranged substantially parallel to a longitudinal axis (AA) of a package (3a) positioned in the cutting station (19).

6. An apparatus (1) according to any one of the preceding claims in which the cutting heads (27) are mounted on respective carriages (28) associated slidably with at least one guide (29).

7. An apparatus (1) according to Claim 6 in which the at least one guide (29) is mounted on the apparatus parallel to a longitudinal axis (AA) of a package (3a) positioned in the cutting station (19).

8. An apparatus (1) according to any one of the preceding claims in which the cutting means (26) comprise means for adjusting the positions of the cutting heads (27) in dependence on the length of the package to be opened.

9. An apparatus (1) according to Claim 8 in which the adjustment means are operatively connected to at least one of the cutting heads (27) in order to define its initial position relative to the package.

10. An apparatus (1) according to Claim 9 in which the initial position corresponds to a central position of a package (3a) positioned in the cutting station (19).

11. An apparatus (1) according to Claims 2 and 9 in which the adjustment means define a travel limit of the cutting head (27) which is adjusted directly, and also act indirectly on the cutting head (27) which is not adjusted directly.

12. An apparatus (1) according to any one of the preceding claims in which the cutting means (26) are mounted on supports (24) movable relative to the basic structure (5) of the apparatus (1).

13. An apparatus (1) according to any one of the preceding claims in which the cutting station (19) comprises two rollers (21) mounted close together in order to support a package (3a) positioned in the cutting station (19).

14. An apparatus (1) according to Claim 13 in which the two rollers (21) are mounted for rotating on the apparatus in opposite directions so as to grasp the wrapping film (2).

15. An apparatus (1) according to any one of the preceding claims in which the cutting means (26) comprise two pressure rollers (23) arranged above a package (3a) positioned in the cutting station (19).

16. An apparatus (1) according to Claim 15 in which the pressure rollers (23) are mounted for rotating on the apparatus.

17. An apparatus (1) according to Claim 16 in which the pressure rollers (23) have ends mounted rotatably on supports (24) movable relative to the basic structure (5) of the apparatus (1).

18. An apparatus according to Claim 17 in which the supports (24) support the cutting heads (27) and the pressure rollers (23), the heads (27) being disposed between the two pressure rollers (23).

19. An apparatus (1) according to any one of the preceding claims in which the loading apparatus (6) has a framework (7) and a drive unit independent of the apparatus (1), the framework (7) being suitable for being connected to the basic structure (5) of the apparatus (1) in order to make the packages (3) available in the input region (9).

20. An apparatus (1) according to any one of the preceding claims, in which the loading apparatus (6) comprises at least one first surface (11) along which the packages (3) are loaded and which is arranged along a vertical axis.

21. A method of removing a wrapping film (2) from packages (3) of objects, in particular of lids (4), the packages having a longitudinal axis (AA), the method comprising the following steps:

- taking the packages (3) from a loading apparatus (6) and directing the packages (3) towards a region (9) for the input along a path (10) perpendicular to the longitudinal axes (AA) of the packages;
- sliding the packages (3) from the region (9) for the input into a cutting station (19) along a path (P) perpendicular to the longitudinal axes (AA) of the packages (3);
- simultaneously starting the cutting at two distinct points of the film (2) with the use of two cutting heads (27) each cutting head (27) being formed by a nozzle (32) connected by means of tubes (33) to a source of heated fluid;
- taking the objects (4) of the packages (3) free of wrapping film (2) from the cutting station (19) and directing them along a path (P) perpendicular to the longitudinal axes (AA) of the packag-

es towards a receiving seat (36) of a region for the output (20) of the objects (4);
- moving the objects (4) towards the output along the longitudinal axis (BB) of the seat (36) perpendicular to the path followed by the packages (3) from the input region (9) to the output region (20), wherein the cutting step is started at two central points of the package (3a), the opening then being lengthened as far as the heads or ends of the package.

22. A method according to Claim 21 in which the opening in the film (2) is lengthened until it covers an entire dimension of the package (3) by bringing about a relative movement of the cutting heads (27) and the package (3a) to be opened.

23. A method according to Claims 21 or 22 in which the step of cutting a lateral portion (2a) of the film (2) takes place substantially continuously, whereas the step of cutting an end portion (2b) of the film (2) is performed by causing the respective cutting head (27) to pause on the portion (2b) to be cut.

24. A method according to any one of claims 21 to 23 in which a step is provided for stretching out the film (2) in the vicinity of the region in which the cutting is performed.

25. A method according to any one of claims 21 to 24 in which a step is provided for grasping of the film (2).

26. A method according to any one of claims 21 to 25 in which a step is provided for the removal of the cut film (2).

Patentansprüche

1. Ein Gerät (1) zur Entfernung einer Verpackungsfolie (2) von Verpackungen (3) von Gegenständen, im besonderen von Deckeln (4), wobei die Verpackungen eine Längsachse (AA) aufweisen, wobei das Gerät (1) eine Einrichtung (26) zum Schneiden der Verpackungsfolie (2) umfasst, wobei die Schneideneinrichtung (26) auf dem Gerät (1) in einem Schneidplatz (19) angebracht ist, die sich zwischen einem Bereich (9) zur Einführung der Verpackungen (3) und einem Bereich (20) zur Ausführung der Gegenstände (4) befindet, die von der Verpakkungsfolie (2) befreit wurden, und wobei die besagte Schneideneinrichtung (26) zwei Schneidköpfe (27) umfasst, die so angebracht sind, dass sie gegenüber dem Gerät (1) entlang einer Achse verschiebbar sind, die grundsätzlich parallel zur Längsachse (AA) einer Verpakkung (3a) ist, die in dem Schneidplatz (19) liegt, **dadurch gekennzeichnet, dass:**

- das Gerät ein Ladergerät (6) umfasst;
- der Bereich (9) zur Einführung die Verpackungen (3) von einem Ladegerät (6) entlang eines Weges (10) erhält, der senkrecht zu den Längsachsen (AA) der Verpackungen verläuft;
- der Schneidplatz (19) die Verpackungen (3) vom Bereich (9) zur Einführung entlang eines Weges (P) erhält, der senkrecht zu den Längsachsen (AA) der Verpackungen verläuft;
- der Bereich zur Ausführung (20) die Verpakkungen von dem Scheidplatz (19) entlang eines Weges (P) erhält, der senkrecht zu den Längsachsen (AA) der Verpackungen verläuft, und einen Aufnahmesitz (36) umfasst, der eine auf einer Grundstruktur (5) des Gerätes (1) angebrachten Wande (37) aufweist, und der einen Ausführungskanal darstellt, der entlang einer Längsachse (BB) verläuft, die senkrecht zu dem Weg verläuft, der von den Verpackungen (3) vom Einführungsbereich (9) bis zum Ausführungsbereich (20) hinterlegt wird, und
- jeder Schneidkopf (27) aus einer Düse (32) gebildet ist, die mit einer Quelle geheizter Flüssigkeit durch Rohre (33) verbunden ist,

wobei die beiden Schneidköpfe (27) jeweils einer Schiebeeinheit (30) zugewiesen sind, damit sie entlang einer Achse gleiten, die grundsätzlich parallel zur Längsachse (AA) der Verpackung (3a) ist, die in dem Schneidplatz (19) liegt, und zwar in entgegen gesetzte Richtungen, und wobei die beiden Schneidköpfe (27) von einer zentralen Stellung zu einer Stellung am Ende der Verpakkung (3a) gleiten, die in dem Schneidplatz (19) liegt.

2. Ein Gerät (1) gemäß Anspruch 1, in dem die beiden Schneidköpfe (27) operativ mit derselben Schiebeeinheit (30) verbunden sind, was deren gleichzeitige Verschiebung in die beiden entgegen gesetzten Richtungen bewirkt.

3. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem die Gleisbewegung der Schneidköpfe (27) im Bereich der Endteile der Verpackung innehält, um den Endteil (2b) der Verpackungsfolie (2) abzuschneiden.

4. Ein Gerät (1) gemäß Anspruch 2, in dem die Schiebeeinheit (30) einen Gurt (31) umfasst, der über Förderelemente (32) gleiten kann, die in dem Gurt (31) einen ersten Teil (31a) und einen zweiten Teil (31b) definieren, die in grundsätzlich entgegen gesetzte Richtungen verlaufen, wobei ein Schneidkopf (27) mit einem der Gurtteile verbunden ist, sodass er sich in die entgegen gesetzte Richtung des andern Schneidkopfes bewegt, der wiederum mit dem andern der beiden Gurtteile verbunden ist.

5. Ein Gerät (1) gemäß Anspruch 4, in dem der Gurt (31) um zwei Förderelemente (32) gewunden ist, wobei der erste und zweite Teil (31a und 31b) grundsätzlich parallel zu einer Längsachse (AA) einer Verpackung (3a) angebracht sind, die in dem Schneidplatz (19) liegt.

6. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem die Schneidköpfe (27) an entsprechenden Laufwerken (28) angebracht sind, die verschiebbar mit mindestens einem Führungsschaft (29) verbunden sind.

7. Ein Gerät (1) gemäß Anspruch 6, in dem der mindestens eine Führungsschaft (29) an dem Gerät parallel zu einer Längsachse (AA) einer Verpackung (3a) angebracht ist, die in dem Scheidplatz (19) liegt.

8. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem die Schneideneinrichtung (26) eine Einrichtung zur Anpassung der Stellung der Schneideköpfe (27) umfasst, die abhängig von der Länge der zu öffnenden Verpackung ist.

9. Ein Gerät (1) gemäß Anspruch 8, in dem die Anpassungseinrichtung operativ mit mindestens einem Schneidkopf (27) verbunden ist, um die Anfangsposition in Bezug auf die Verpackung festzustellen.

10. Ein Gerät (1) gemäß Anspruch 9, in dem die Anfangsposition einer zentralen Stellung der Verpakkung (3a) entspricht, die in dem Schneidplatz (19) liegt.

11. Ein Gerät (1) gemäß Anspruch 2 und 9, in dem die Anpassungseinrichtung ein Gleitlimit des Schneidekopfes (27) definiert, der direkt angebracht ist, und wobei die Anpassungseinrichtung auch indirekt auf den Schneidekopf (27) wirkt , der nicht direkt angebracht ist.

12. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem die Schneideinrichtung (26) am Stützen (24) angebracht ist, die verschiebbar gegenüber der Grundstruktur (5) des Gerätes (1) sind.

13. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem der Scheidplatz (19) zwei Walzen (21) umfasst, die nah aneinander angebracht sind, sodass sie eine Verpackung (3a) stützen, die in dem Schneidplatz (19) liegt.

14. Ein Gerät (1) gemäß Anspruch 13, in dem die zwei Walzen (21) zum Rotieren in entgegen gesetzte Richtungen am Gerät angebracht sind, um die Verpackungsfolie (2) zu fassen.

15. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem die Schneideneinrichtung (26) zwei Druckwalzen (23) umfasst, die über der Verpackung (3a) angebracht sind, die in dem Schneidplatz (19) liegt.

16. Ein Gerät (1) gemäß Anspruch 15, in dem die Druckwalzen (23) zum Rotieren an dem Gerät angebracht sind.

17. Ein Gerät (1) gemäß Anspruch 16, in dem die Druckwalzen (23) Enden aufweisen, die rotierbar an Stützen (24) angebracht sind, die verschiebbar gegenüber der Grundstruktur (5) des Gerätes (1) sind.

18. Ein Gerät (1) gemäß 17, in dem die Stützen (24) die Schneideköpfe (27) und die Druckwalzen (23) tragen, wobei die Köpfe (27) zwischen den zwei Druckwalzen (23) angebracht sind.

19. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem das Ladegerät (6) ein Gerüst (7) und eine Schiebeeinheit aufweist, die unabhängig vom Gerät (1) sind, wobei das Gerüst (7) geeignet ist, mit der Grundstruktur (5) des Gerätes (1) verbunden zu werden, sodass die Verpackungen (3) in dem Einführbereich (9) empfangen werden können.

20. Ein Gerät (1) gemäß jedem der vorhergehenden Ansprüche, bei dem das Ladegerät (6) mindestens eine erste Fläche (11) umfasst, entlang der die Verpakkungen (3) geladen werden und die entlang einer vertikalen Achse angebracht ist.

21. Eine Methode zur Entfernung einer Verpackungsfolie (2) von Verpackungen (3) von Gegenständen, im besonderen von Deckeln (4), wobei die Verpackungen (3) eine Längsachse (AA) aufweisen, wobei die Methode folgende Schritte umfasst:

- die Verpackungen (3) von dem Ladegerät (6) entnehmen und die Verpackungen (3) zu einem Einführbereich (9) entlang eines Weges (10) führen, der senkrecht zu den Längsachsen (AA) der Verpackungen verläuft;
- die Verpackungen (3) von dem Einführbereich (9) in den Schneidplatz (19) entlang eines Weges (P) schieben, der senkrecht zu den Längsachsen (AA) der Verpackungen (3) verläuft;
- an zwei verschiedenen Stellen der Verpakkungsfolie (2) mit der Hilfe von Schneideköpfen (27) mit dem Schneiden gleichzeitig beginnen, wobei jeder Schneidkopf (27) aus einer Düse (32) gebildet ist, die mit einer Quelle geheizter Flüssigkeit durch Rohre (33) verbunden ist;
- die Gegenstände (4) der Verpackungen (3) ohne Verpackungsfolie (2) von dem Schneidplatz (19) nehmen und sie entlang des Weges (P), der senkrecht zu den Längsachsen (AA) der

Verpackungen verläuft, zu einem Empfangssitz (36) in einem Bereich des Outputs (20) der Gegenstände (4) leiten;
- die Gegenstände (4) vom Einführungsbereich (9) zum Ausführungsbereich (20) zum Output entlang der Längsachse (BB) des Empfangssitzes (36) schieben, den senkrecht zu dem Weg der Verpackungen (3) verläuft, wobei der Schneidenschritt an zwei zentralen Punkten der Verpackung (3a) beginnt, wobei die Öffnung dann bis zu den Anfängen und Enden der Verpackung verlängert wird.

22. Eine Methode gemäß Anspruch 21, bei der das Öffnen der Verpackungsfolie (2) verlängert wird, bis sie einen ganzen Umfang der Verpackung (3) deckt, indem eine entsprechende Bewegung der Schneideköpfe (27) und der zu öffnenden Verpackung (3a) erbracht wird.

23. Eine Methode gemäß Ansprüche 21 oder 22, bei der der Schritt des Schneidens des seitlichen Teiles (2a) der Folie (2) grundsätzlich kontinuierlich stattfindet, während der Schritt des Schneidens des Endteiles (2b) der Folie (2) durchgeführt wird, indem der jeweilige Schneidekopf (27) and dem zu schneidenden teil (2b) angehalten wird.

24. Eine Methode gemäß jedem der Ansprüche 21 bis 23, bei der ein Schritt zur Ausdehnung der Folie (2) in der Nähe der Region ausgeführt wird, in der das Schneiden durchgeführt wird.

25. Eine Methode gemäß jedem der Ansprüche 21 bis 24, bei der ein Schritt zum Fassen der Folie (2) stattfindet.

26. Eine Methode gemäß jedem der Ansprüche 21 bis 25, bei der ein Schritt zur Entfernung der geschnittenen Folie (2) stattfinden.

Revendications

1. Un appareil (1) pour enlever une pellicule d'enveloppement (2) des emballages (3) d'objets, en particulier de couvercles (4), les emballages ayant un axe longitudinal (AA), l'appareil comportant des moyens (26) pour couper la pellicule d'enveloppement (2), les moyens de coupage (26) étant montés sur l'appareil (1) dans un poste de coupage (19) aménagé entre une région (9) pour l'entrée des emballages (3) et une région (20) pour la sortie des objets (4) dégagés de la pellicule d'enveloppement (2), et lesdits moyens de coupage (26) comportent deux têtes de coupage (27) montées de façon à être mobiles par rapport à l'appareil (1) le long d'un axe substantiellement parallèle à l'axe longitudinal (AA) d'un emballage (3a) aménagé dans le poste de coupage (19), **caractérisé en ce que**:

- l'appareil comporte un appareil de chargement (6);
- la région (9) pour l'entrée reçoit les emballages (3) de l'appareil de chargement (6) le long d'une voie (10) perpendiculaire aux axes longitudinaux (AA) des emballages;
- le poste de coupage (19) reçoit les emballages (3) de la région (9) pour l'entrée le long d'une voie (P) perpendiculaire aux axes longitudinaux (AA) des emballages ;
- la région pour la sortie (20) reçoit les emballages du poste de coupage (19) le long d'une voie (P) perpendiculaire aux axes longitudinaux (AA) des emballages et comporte un siège de réception (36) comprenant une paroi (37) montée sur une structure de base (5) de l'appareil (1) et définissant un canal de sortie qui s'étend le long d'un axe longitudinal (BB) qui est perpendiculaire à la voie suivie par les emballages (3) de la région d'entrée (9) vers la région de sortie (20),
- chaque tête de coupage (27) est formée par une tuyère (32) branchée par le biais de tubes (33) à une source de fluide chauffé,

dans lequel les deux têtes de coupage (27) sont associées, respectivement, à une unité d'entraînement (30) pour les faire déplacer le long d'un axe substantiellement parallèle à une axe longitudinal (AA) de l'emballage (3a) aménagé dans le poste de coupage (19), et dans des directions opposées et dans lequel chacune des deux têtes de coupage (27) se déplace d'une position centrale vers une position à la fin de l'emballage (3a) positionné dans le poste de coupage (19).

2. Un appareil (1) selon la revendication 1, dans lequel les deux têtes de coupage (27) sont opérationnellement branchées à la même unité d'entraînement (30) qui amorce leur déplacement simultané dans les deux directions opposées.

3. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel le mouvement de déplacement des têtes de coupage (27) est interrompu dans la région des portions terminales de l'emballage en vue de couper la portion terminale (2b) de la pellicule d'enveloppement (2).

4. Un appareil (1) selon la revendication 2, dans lequel l'unité d'entraînement (30) comporte une courroie (31) qui peut se déplacer par-dessus des éléments de transmission (32) qui définissent, dans la courroie (31), au moins une première portion (31a) et une seconde portion (31b) qui bougent dans des direc-

tions substantiellement opposées, une tête de coupage (27) étant branchée à l'une des portions de la courroie afin de bouger dans la direction opposée par rapport à l'autre tête de coupage qui est branchée, à son tour, à l'autre des deux portions de la courroie.

5. Un appareil (1) selon la revendication 4, dans lequel la courroie (31) est enveloppée sur deux éléments de transmission (32), les première et seconde portions (31a, 31b) étant aménagées substantiellement parallèles à une axe longitudinal (AA) d'un emballage (3a) positionné dans le poste de coupage (19).

6. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel les têtes de coupage (27) sont montées sur leurs chariots respectifs (28) associés d'une façon coulissante à au moins une guide (29).

7. Un appareil (1) selon la revendication 6, dans lequel au moins l'une guide (29) est montée sur l'appareil parallèlement à un axe longitudinal (AA) d'un emballage (3a) positionné dans le poste de coupage (19).

8. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel les moyens de coupage (26) comportent des moyens pour régler les positions des têtes de coupage (27) en fonction de la longueur de l'emballage à ouvrir.

9. Un appareil (1) selon la revendication 8, dans lequel les moyens de réglage sont opérationnellement branchés à au moins l'une des têtes de coupage (27) afin de définir leur position initiale par rapport à l'emballage.

10. Un appareil (1) selon la revendication 9, dans lequel la position initiale correspond à une position centrale d'un emballage (3a) positionné dans le poste de coupage (19).

11. Un appareil (1) selon les revendications 2 et 9, dans lequel les moyens de réglage définissent une limite de déplacement de la tête de coupage (27) qui est directement réglée, et ils agissent aussi indirectement sur la tête de coupage (27) qui n'est pas directement réglée.

12. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel les moyens de coupage (26) sont montés sur des soutiens (24) mobiles par rapport à la structure de base (5) de l'appareil (1).

13. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel le poste de coupage (19) comporte deux rouleaux (21) montés tout près l'un de l'autre afin de soutenir un emballage (3a) positionné dans le poste de coupage (19).

14. Un appareil (1) selon la revendication 13, dans lequel les deux rouleaux (21) sont montés pour tourner sur l'appareil dans des directions opposées de façon à saisir la pellicule d'enveloppement (2).

15. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel les moyens de coupage (26) comportent deux rouleaux presseurs (23) aménagés par-dessus un emballage (3a) positionné dans le poste de coupage (19).

16. Un appareil (1) selon la revendication 15, dans lequel les rouleaux presseurs (23) sont montés pour tourner sur l'appareil.

17. Un appareil (1) selon la revendication 16, dans lequel les rouleaux presseurs (23) ont des extrémités montées en rotation sur des soutiens (24) mobiles par rapport à la structure de base (5) de l'appareil (1).

18. Un appareil (1) selon la revendication 17, dans lequel les soutiens (24) soutiennent les têtes de coupage (27) et les rouleaux presseurs (23), les têtes (27) étant aménagées entre les deux rouleaux presseurs (23).

19. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel l'appareil de chargement (6) a un bâti (7) et une unité d'entraînement autonome par rapport à l'appareil (1), le bâti (7) étant relié à la structure de base (5) de l'appareil (1) afin de rendre disponibles les emballages (3) dans la région d'entrée (9).

20. Un appareil (1) selon l'une quelconque des revendications précédentes, dans lequel l'appareil de chargement (6) comporte au moins une première surface (11) le long de laquelle les emballages (3) sont chargés et qu'il est aménagée le long d'un axe vertical.

21. Une méthode pour enlever une pellicule d'enveloppement (2) de emballages (3) d'objets, en particulier de couvercles (4), les emballages ayant un axe longitudinal (AA), la méthode comportant les phases suivantes :

- prendre les emballages (3) depuis un appareil de chargement (6) et acheminer les emballages (3) vers une région (9) pour l'entrée le long d'une voie (10) perpendiculaire aux axes longitudinaux (AA) des emballages ;
- faire coulisser les emballages (3) depuis la région (9) pour l'entrée dans un poste de coupage (19) le long d'une voie (P) perpendiculaire aux

axes longitudinaux (AA) des emballages (3) ;
- en même temps amorcer le coupage dans deux points distincts de la pellicule (2) en utilisant les deux têtes de coupage (27), chaque tête de coupage (27) étant formée par une tuyère (32) branchée par le biais de tubes (33) à une source de fluide chauffé ;
- prendre les objets (4) des emballages (3) dégagés de leur pellicule d'enveloppement (2) du poste de coupage (19) et les acheminer le long d'une voie (P) perpendiculaire aux axes longitudinaux (AA) des emballages vers un siège de réception (36) d'une région pour la sortie (20) des objets (4) ;
- faire bouger les objets (4) vers la sortie le long de l'axe longitudinal (BB) du siège (36) perpendiculaire à la voie suivie par les emballages (3) de la région d'entrée (9) vers la région de sortie (20), dans lequel la phase de coupage est amorcée dans deux points centraux de l'emballage (3a), l'ouverture étant alors allongée jusqu'aux têtes ou aux extrémités de l'emballage.

22. Une méthode selon la revendication 21, dans lequel l'ouverture dans la pellicule (2) est allongée tant qu'elle ne couvre pas une dimension tout entière de l'emballage (3) en engendrant un mouvement relatif des têtes de coupage (27) et de l'emballage (3a) à ouvrir.

23. Une méthode selon la revendication 21 ou 22, dans lequel la phase de coupage d'une portion latérale (2a) de la pellicule (2) a lieu substantiellement sans cesse, tandis que la phase de coupage d'une portion finale (2b) de la pellicule (2) est exécutée en laissant s'arrêter la tête de coupage respective (27) sur la portion (2b) à couper.

24. Une méthode selon l'une quelconque des revendications 21 à 23, dans lequel une phase est prévue pour tendre la pellicule (2) à proximité de la région où le coupage est exécuté.

25. Une méthode selon n'importe quelle des revendications 21 à 24, dans lequel une phase est prévue pour saisir la pellicule (2).

26. Une méthode selon l'une quelconque des revendications 21 à 25, dans lequel une phase est prévue pour enlever la pellicule coupée (2).

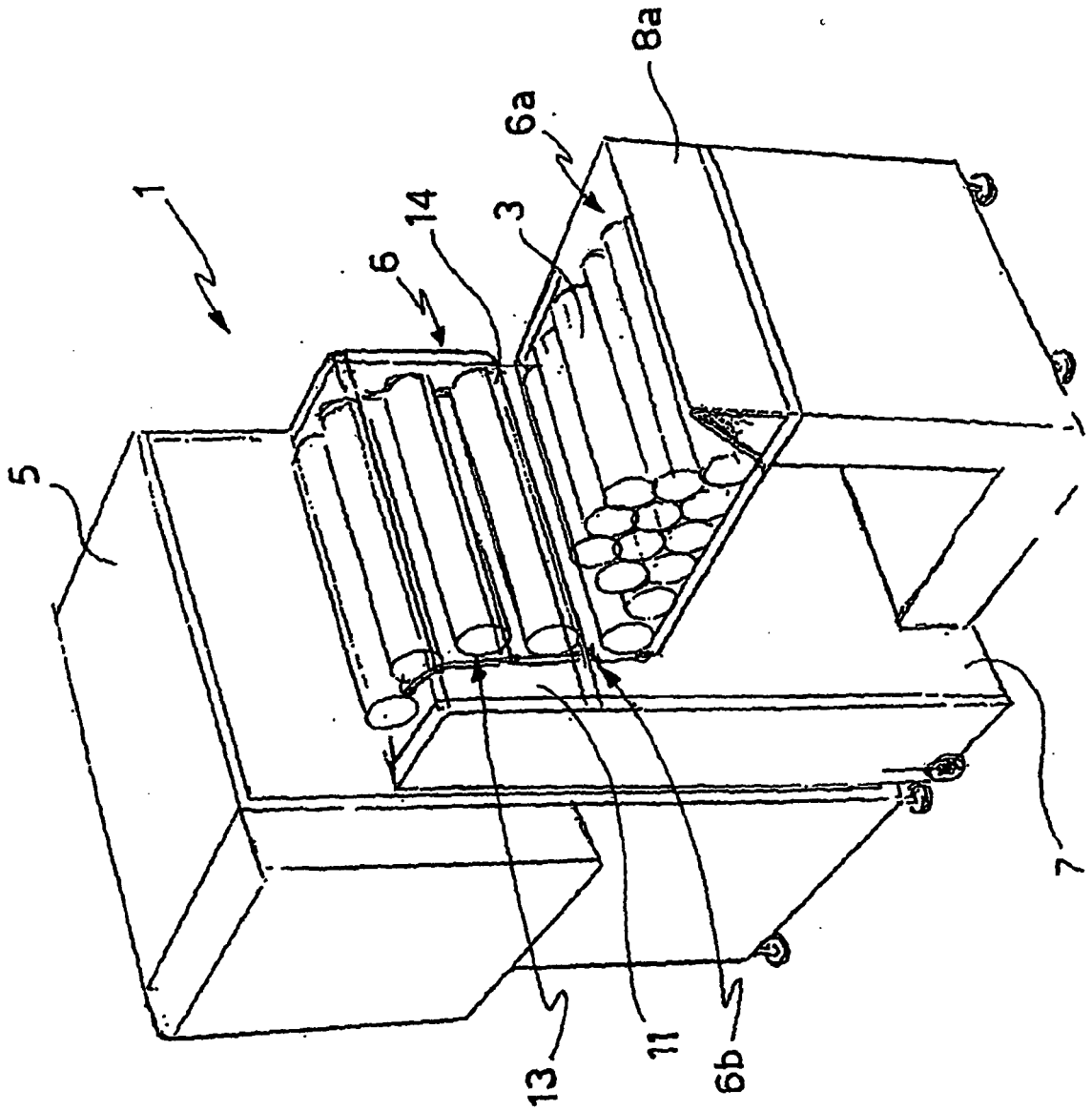

FIG.1

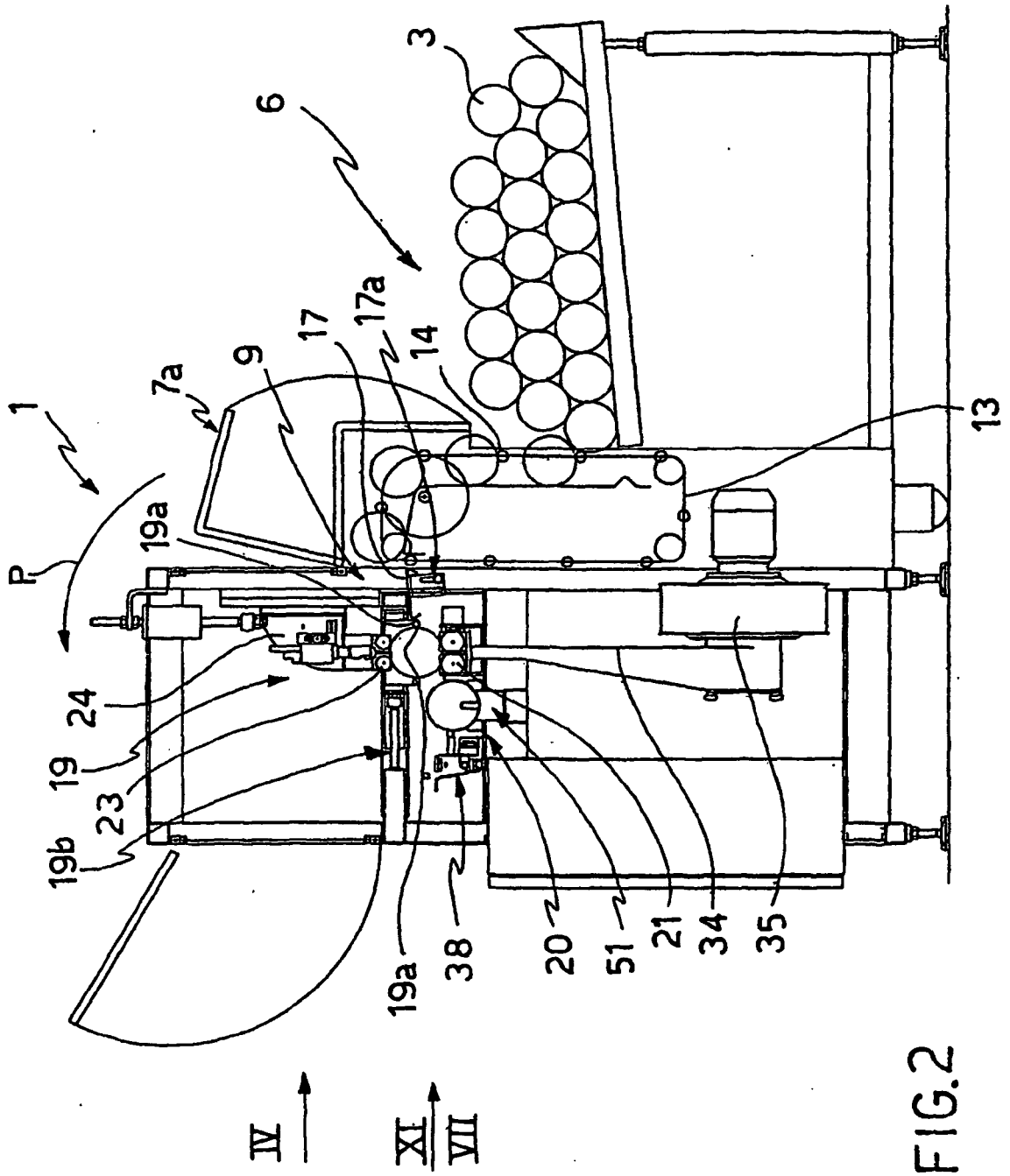
3
6
17a
17
14
9
7a
1
13
19a
P
24
19
23
19b
38
20
51
21
34
35
19a
IV
XI
VII

FIG.2

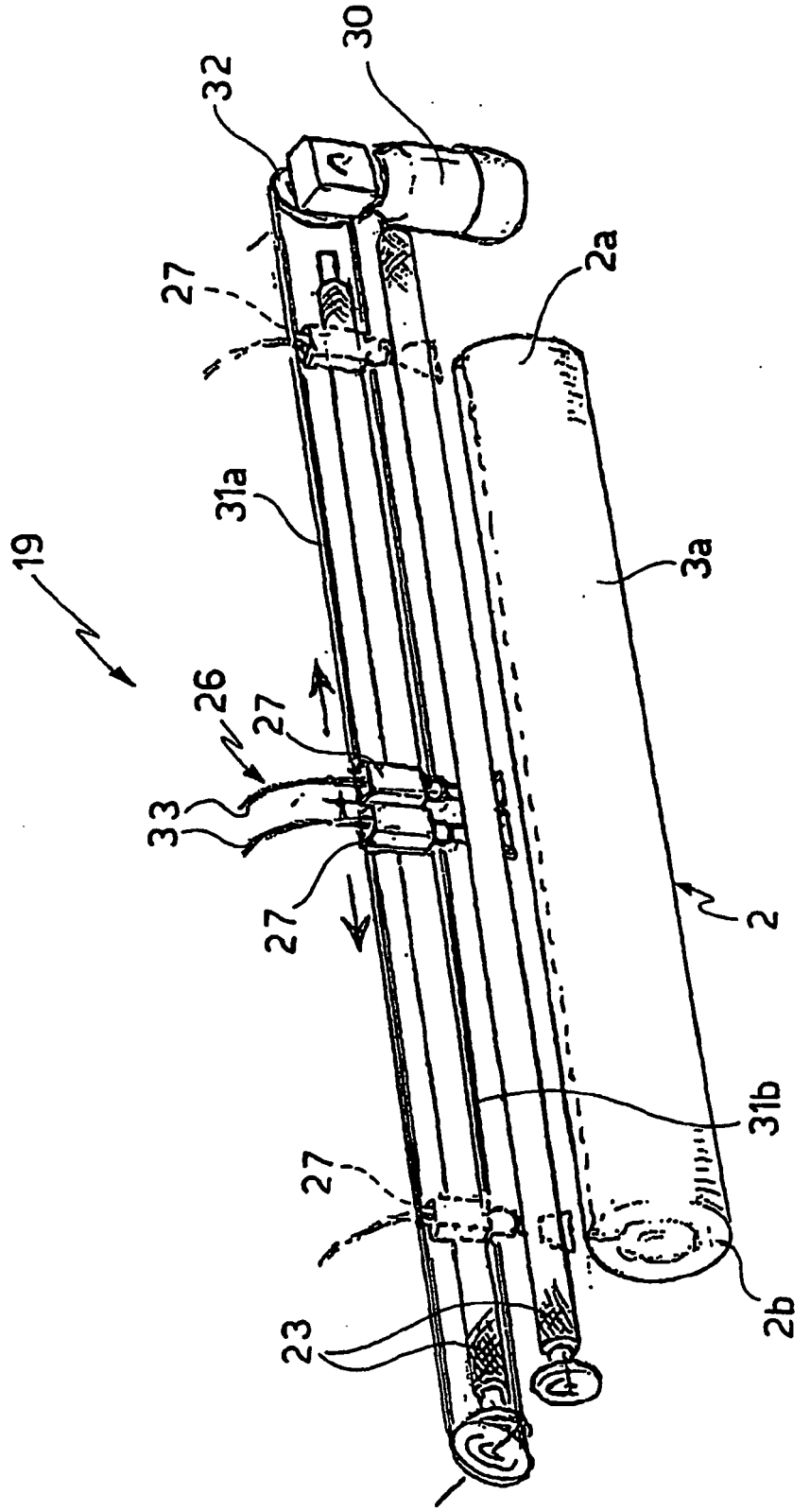

FIG. 3

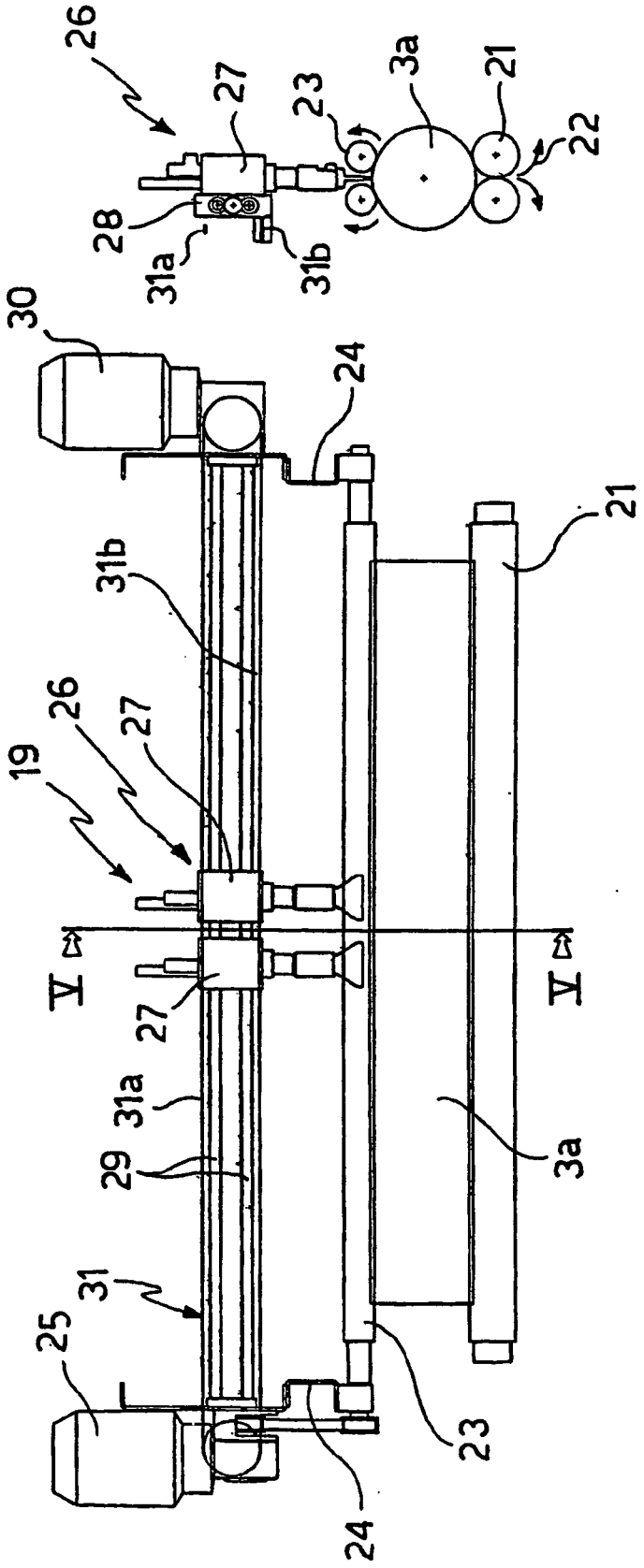
26
27
23
3a
21
22
28
31a
31b
30
24
21
31b
26
27
19
V
V
27
31a
29
3a
31
25
23
24

FIG. 5

FIG.4

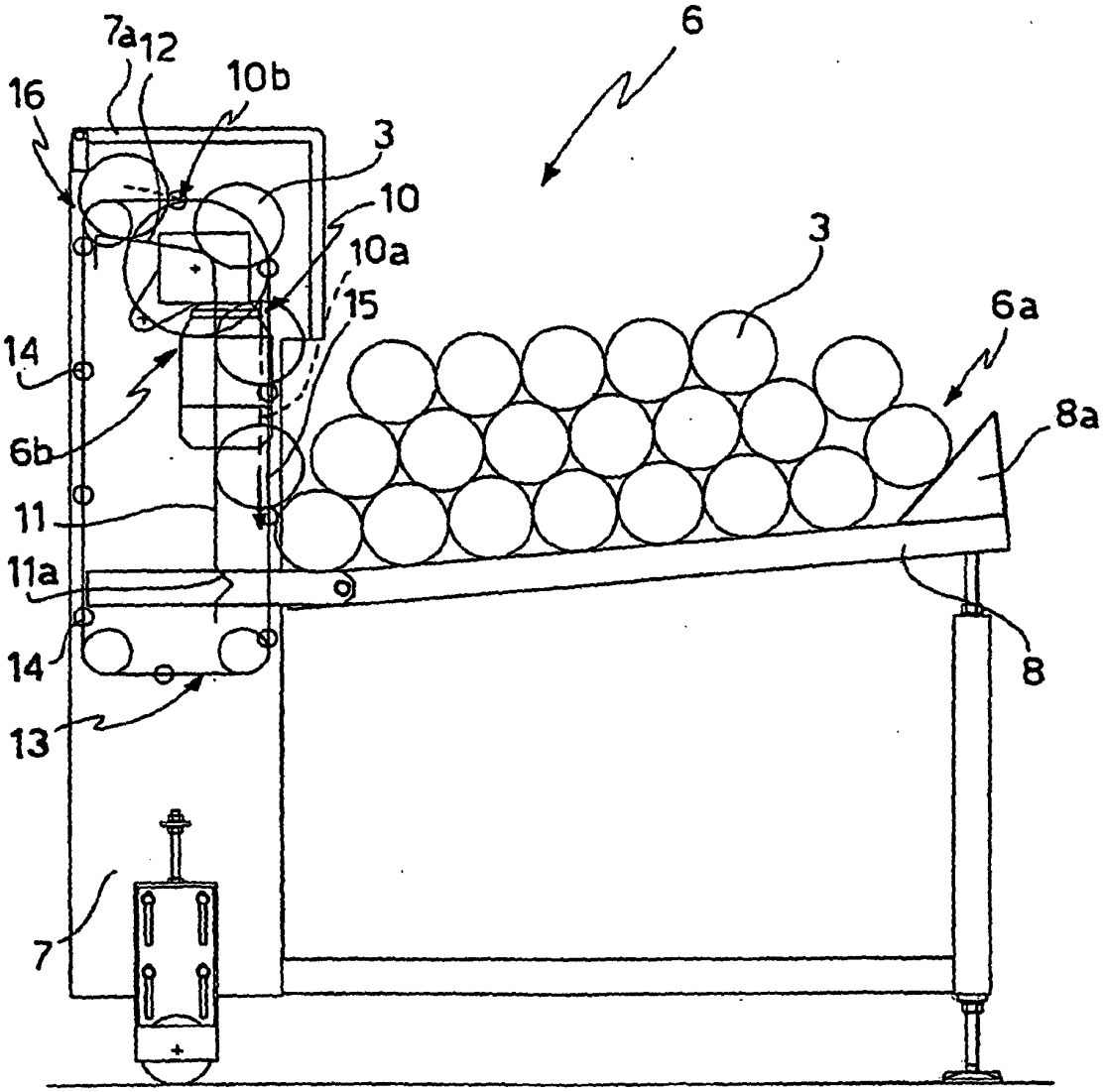

FIG. 6

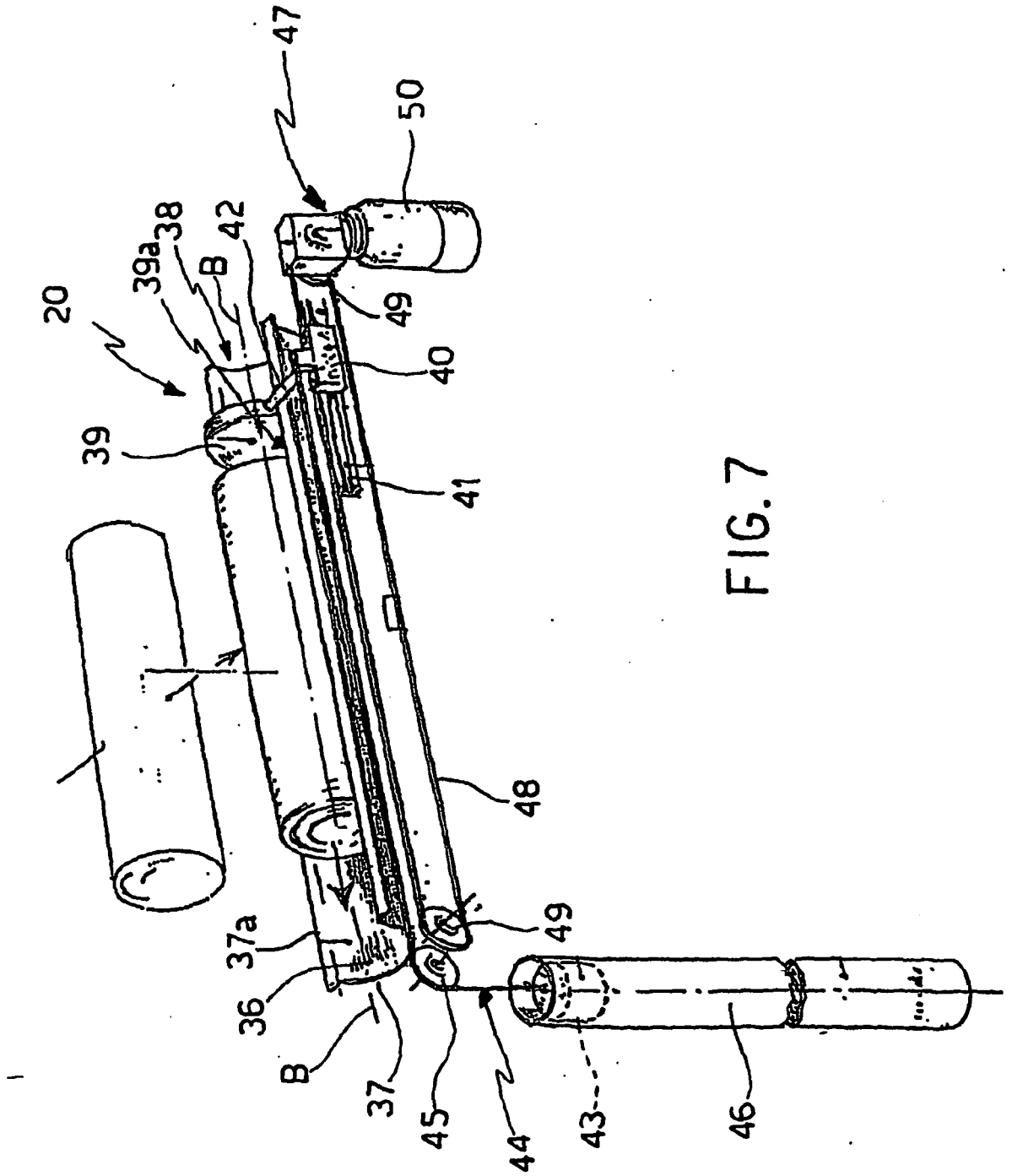

FIG. 7

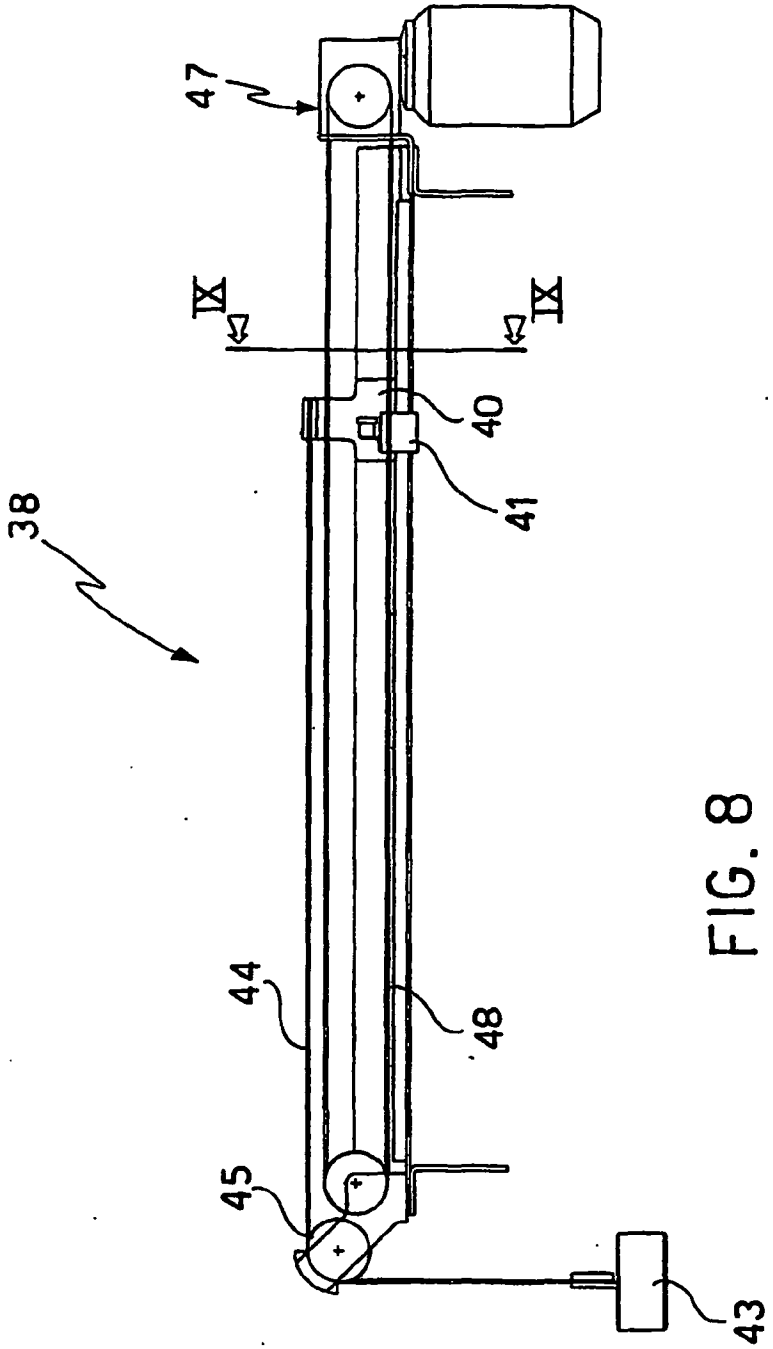

FIG. 8

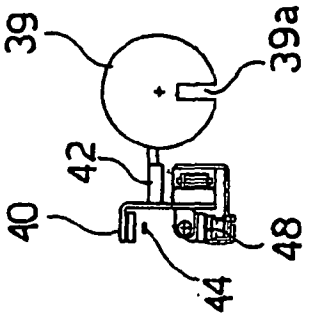

FIG. 9

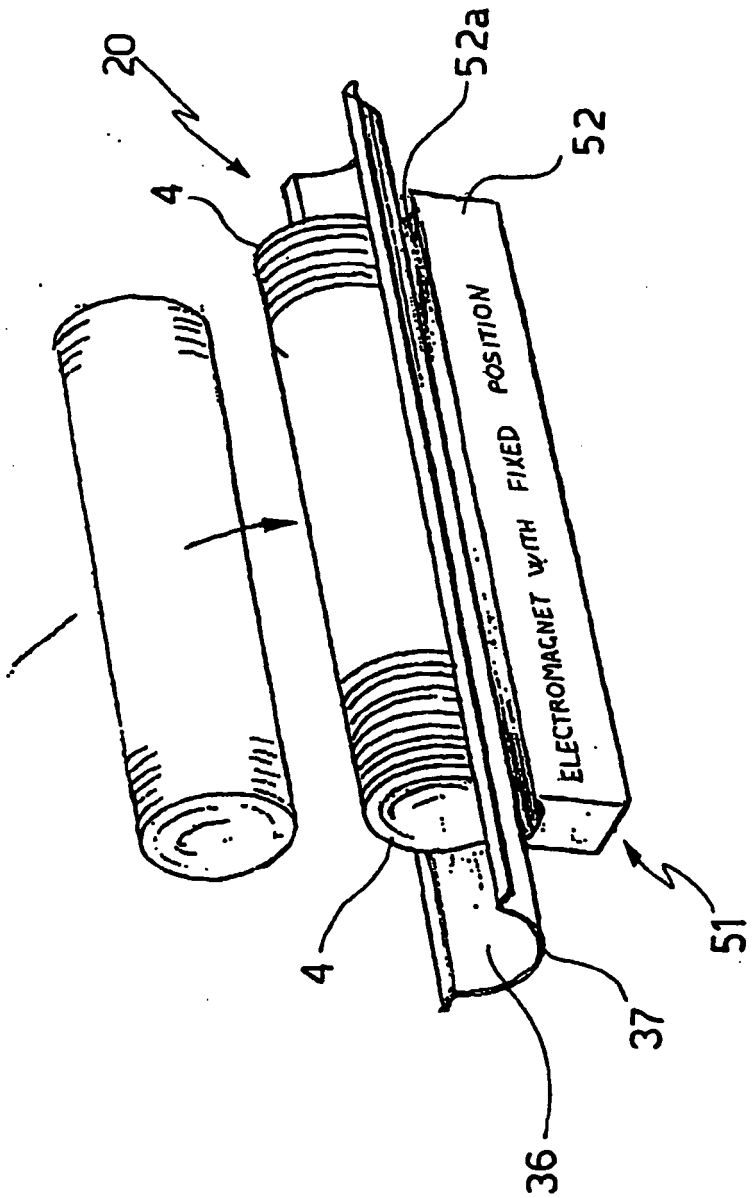

FIG.10

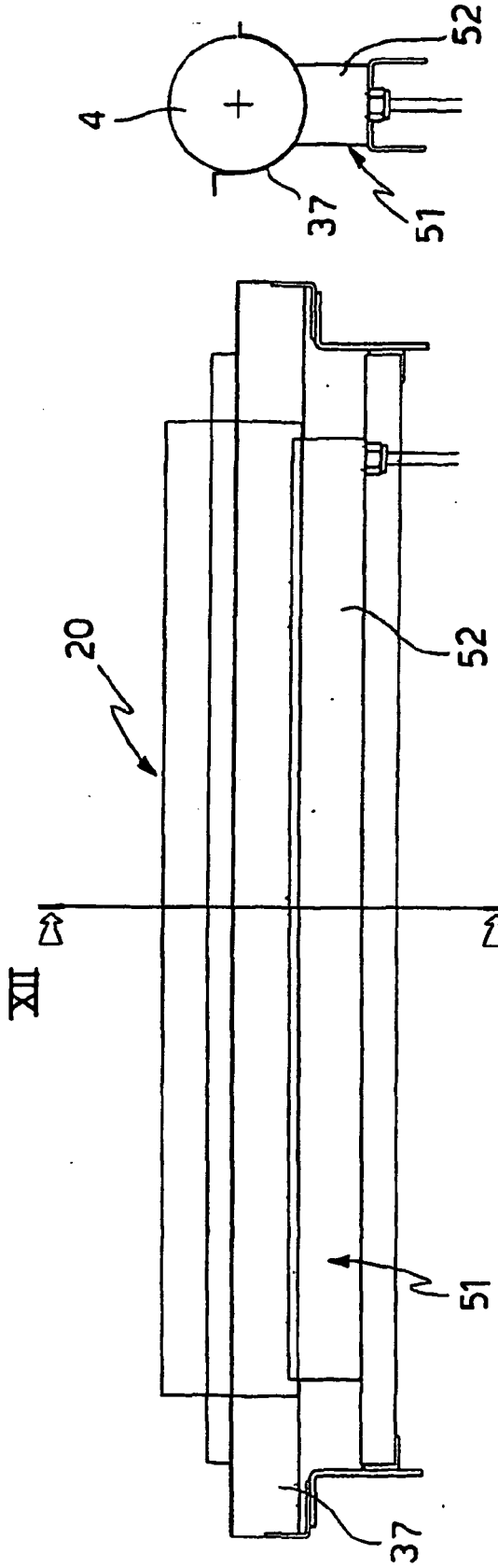

FIG.11

FIG.12

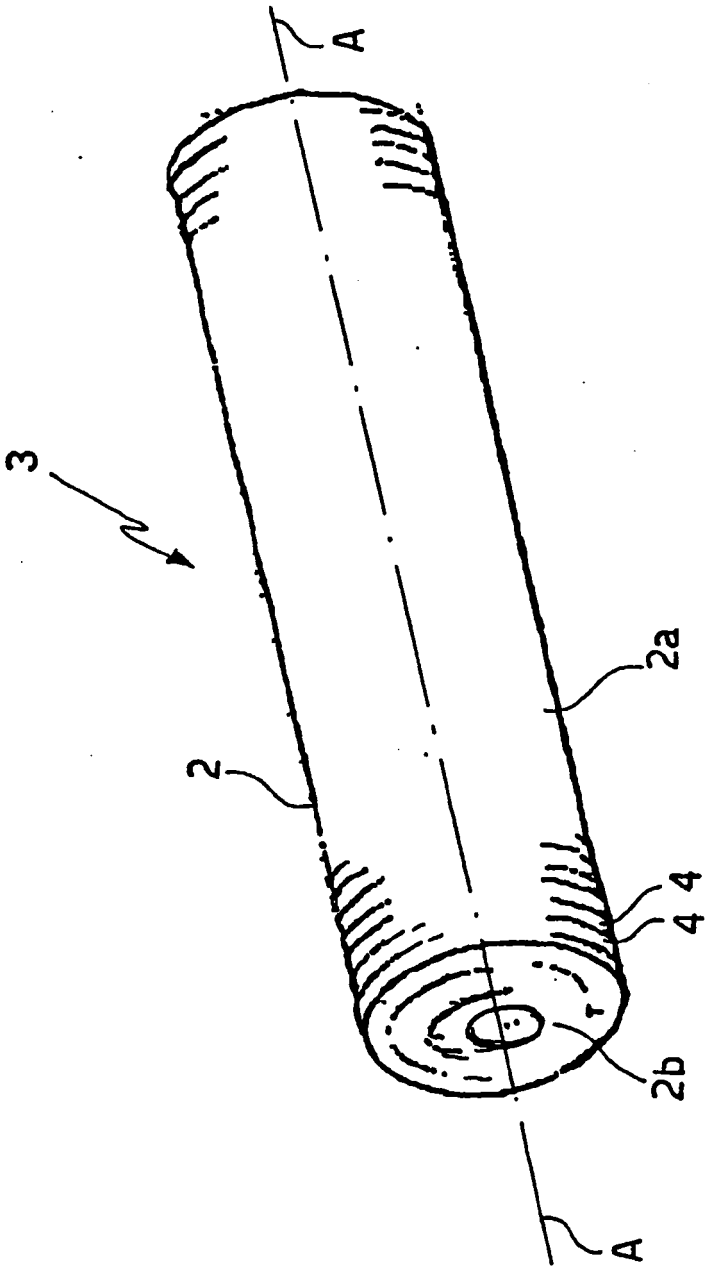

FIG.13

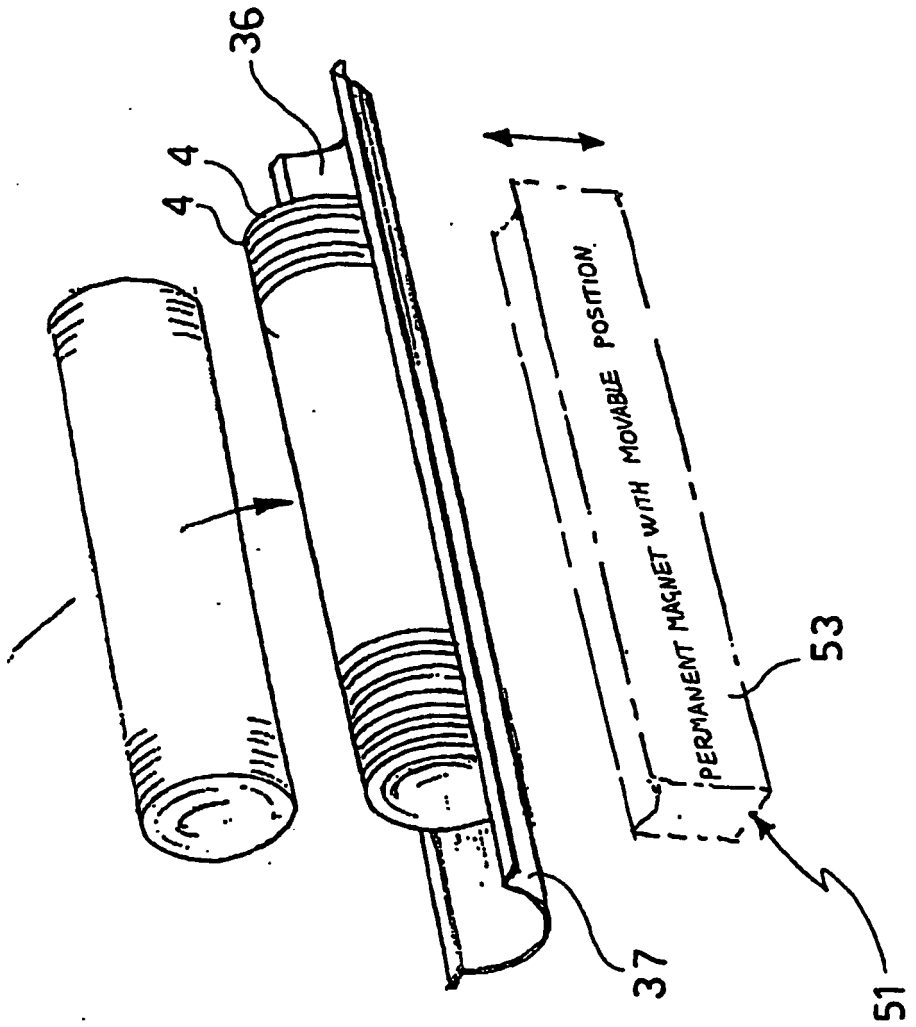

FIG.14

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 4344268 A **[0016]**