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(54) **Apparatus for closing a packing**

Vorrichtung zum Verschliessen einer Verpackung

Dispositif pour fermer un emballage

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EP 0 526 950 B2

Description

[0001] The present invention relates to an apparatus for closing a packing consisting of an upper part having a downward hanging edge and a lower part having a protruding flange, said closing apparatus comprising a base carrying means for holding the packing in a closing position and a closing part moveably arranged with respect thereto, said closing part comprising a pressure plate and a ring consisting of a plurality of ring segments moveable in radial direction substantially parallel to said pressure plate between a release position in which the dimensions in peripheral direction of the ring are greater than those of the packing and a first closing position in which the dimensions in peripheral direction of the ring are smaller than those of the packing, and moveable in a direction substantially transversely of the pressure plate between the first closing position and a second closing position in which said packing is pressed close between said ring segments and said pressure plate, said ring segments being arranged on said closing part such that they are moveable in said directions only when said pressure plate and said base are in their fully closed abutting position, in which position the upper part of the packing just makes contact with the pressure plate. Such an apparatus, which was shown at the MACROPACK exhibition held in Utrecht (NL) from April 15 to 19, 1991, is employed for example for closing heat-retaining packagings for meals.

[0002] The closing apparatus as shown at the MACROPACK exhibit, which is illustrated in fig. 1, comprised a base 5 and a closing part 7 hingedly connected thereto. The base 5 included a recess 25 for receiving a packing 4 to be closed. The closing part 7 included a pressure plate 8 and four ring segments 9 that were movable towards each other to fold a downward hanging edge 16 of the packing 4 round a protruding flange 15 thereof. In this publicly exhibited closing apparatus the ring segments 19 were only moved together after the closing part 7 had been brought down to a position in which the pressure plate 8 just touched an upper part 3 of the packing 4.

[0003] From EP-A-0 209 890 a closing apparatus is known having a base, an upper part and a bead forming member connected to the upper part by a quadrilink. In order to close a two part packaging, this packaging is placed on the base of the closing apparatus, and this base is subsequently moved upwards, bringing the upper part of the packing in contact with the upper part of the apparatus acting as counterpressure plate. The base of the closing apparatus is moved further upwards, forcing the counterpressure plate against a pressure member that is connected to the quadrilink. This quadrilink converts the upward movements of the base and packing into an inward and upward movement of a bead forming member, which then forces the two parts of the packing together.

[0004] The invention has for its object to provide a

closing apparatus as described above, with which a packing can be closed more rapidly and simply than previously. According to the invention this is achieved in that each ring segment is slidably mounted in the pressure plate, a spacer member is arranged between each segment and the pressure plate, and in that the pressure plate has a plurality of receiving spaces for the spacer members, which are arranged such that in the first closing position each spacer member is aligned with a receiving space and is received therein during a movement of its associated ring segment to the second closing position. In this manner compressive forces can be applied to press together the upper and lower party of the packing while maintaining folding forces for keeping the downward hanging edge of the upper part folded around the protruding flange of the lower part.

[0005] A preferred embodiment of the closing apparatus according to the invention that is simple to operate has control means connected to the segments and moveable with respect to the closing part, said control means including a lever pivotally arranged on the pressure plate, a bridge piece pivotally connected to the lever and movable substantially transversely of the main plane of the pressure plate and pivot arms connecting the bridge piece to the ring segments, such that a movement of the bridge piece away from the pressure plate results in the ring segments being moved from their release position to their first and second closing positions, respectively.

[0006] The closing apparatus preferably has a recess arranged in the base for receiving the packing and stops protruding out of the pressure plate, wherein the depth of the recess and the height of the stops are geared to one another such that in the closed position of the closing part the distance between a bottom surface of the recess and the pressure plate corresponds with the height of the packing. In order to be able to close packagings of different heights the apparatus preferably has at least one filler piece arranged in the recess.

[0007] The invention will now be elucidated on the basis of an embodiment, wherein reference is made to the drawing, in which:

fig. 1 is a perspective view of the closing apparatus as shown at the MACROPACK exhibition and a packing to be closed therewith,

fig. 2 shows a perspective view of the closing apparatus of the invention with dismantled parts, prior to the actual closing movement,

fig. 3 shows a view corresponding with fig. 2 of the apparatus during the closing movement,

wherein a number of components have been omitted for the sake of clarity,

fig. 4 is a partially sectional view along the line IV-IV in fig. 2,

fig. 5 shows a view corresponding with fig. 4 of the apparatus in the position shown in fig. 3,

fig. 6A to D show partially sectional detail views ac-

cording to the arrow VI in fig. 4 and 5 during different phases of the closing operation, and fig. 7 is a perspective view of a ring segment of the closing apparatus

[0008] An apparatus 1 for closing a packing 4 consisting of two parts 2, 3 (fig. 1) comprises a base 5 having arranged thereon means 6 closely enclosing the packing for holding the packing 4 in a closing position. A closing part 7 of the apparatus 1 is hingeably arranged on the base 5 and comprises a pressure surface 8 in the form of a profiled pressure plate, ring segments 9 mounted slidably therein, a lever 10 connected to the ring segments 9 over a control mechanism (not shown here), a protective cover 11 for the control mechanism, and stop bosses 13 co-acting with stop recesses 12 of the base 5.

[0009] In order to close the packing 4 the upper part 3 is placed in the manner indicated by the arrows onto the bottom part 2, whereby a downward hanging edge 16 of the upper part 3 falls round a protruding flange 15 of the bottom part 2. The packing 4 is then placed in a recess 25 in the base 5 between the holding means 6. The closing part 7 is then pivoted downward using the lever 10 counter to the action of a hold-open spring 17 (fig. 6A) until the bosses 13 rest in the stop recesses 12. The apparatus 1 is dimensioned such that in this position the upper part of the packing 4 just makes contact with the pressure plate 8 (fig. 6B). (For packagings 4 with a different height filler pieces (not shown here) can be placed in the recess 25 in the base 5). The inner periphery of the ring 14 formed by the segments 9 is larger in this position than the outer periphery of the flange 15.

[0010] The lever 10 is then moved further downward whereby the ring segments 9 are moved towards each other from their release position into a first closing position in which the inner periphery of the ring 14 is smaller than the outer periphery of the flange 15. The downward hanging edge 16 of the upper packing part 3 is hereby folded round the protruding flange 15 of the bottom packing part 2 (fig. 6C). By moving the lever 10 still further downward the ring segments 9 are moved substantially transversely of the main plane of the pressure plate 8 theretoward to a second closing position in which the flange 15 and the edge 16 folded therearound are pressed together between nose portions 26 of the segments 9 and a rib 27 running round the pressure plate 8, whereby a bead is formed and a good closure of the packing 4 is ensured (fig. 6D). The lever 10 is then moved upward whereby the segments 9 are moved back to their releasing position and the closing part 7 is pivoted upward so that the closed packing 4 can be taken out of the apparatus 1.

[0011] The movements of the ring segments 9 are controlled by a control mechanism 18 (fig. 2) connecting the lever 10 and the segments 9 and consisting of a bridge piece 19 and pivot arms 20 connecting the bridge

piece 19 to the ring segments 9. The bridge piece 19 is pressed onto the pressure plate 8 using bias springs 21 supporting against the cover 11, so that the ring segments 9 can be held by the pivot arms 20 in their release position located furthest to the outside.

[0012] When the lever 10 is pivoted downwards relative to the pressure plate 8 (fig. 3), the bridge piece 19 is moved upward from the pressure plate 8 by means of lifting arms 22 pivotally connected to the lever 10, whereby the ring segments 9 are moved towards each other by the pivot arms 20. As a result of the orientation of the pivot arms 20 a force directed obliquely upward is exerted on the ring segments 9. Between each ring segment 9 and the pressure plate 8 a spacer member 23 is therefore arranged (fig. 4), which ensures that between the release position and the first closing position the segment 9 moves substantially parallel to the pressure plate 8 (fig. 6C). When the ring segment 9 has reached the first closing position, the spacer member 23 is situated in register with a receiving space 24 recessed into the pressure plate 8, so that the segment 9 is moved toward the pressure plate 8 to the second closing position under influence of the upward directed force exerted by the pivot arm 20 (fig. 5, 6D).

[0013] In order to cause the movement of the segment 9 along the pressure plate 8 to progress easily, the spacer member 23 takes a cylindrical form (fig. 7), and is received in a semi-cylindrical recess in the ring segment 9.

[0014] Because the ring 14 in the embodiment shown is divided into segments 9 such that a segment 9 engages onto each corner of the packing 4, a uniform force can be exerted on the edge 16 in all directions using a minimum number of separate segments 9. It is however conceivable to divide a folding ring 14 of the form shown into a larger or smaller number of segments 9. This results however in a greater mechanical complexity or a less good distribution of force.

[0015] In the embodiment shown a closing apparatus 1 is described for use with a rectangular packing 4. The invention can however also be applied with packagings of a shape other than that shown here, wherein the shape of the closing ring 14, of the recess 25 and of the holding means 6, the number of segments 9 and the control mechanism 18 can then be adapted correspondingly.

Claims

1. Apparatus (1) for closing a packing (4) consisting of an upper part (3) having a downward hanging edge (16) and a lower part (2) having a protruding flange (15), said closing apparatus (1) comprising a base (5) carrying means (6) for holding the packing (4) in a closing position and a closing part (7) moveably arranged with respect thereto, said closing part (7) comprising a pressure plate (8) and a ring (14) consisting of a plurality of ring segments (9) moveable

in radial direction substantially parallel to said pressure plate (8) between a release position in which the dimensions in peripheral direction of the ring (14) are greater than those of the packing (4) and a first closing position in which the dimensions in peripheral direction of the ring (14) are smaller than those of the packing (4), and moveable in a direction substantially transversely of the pressure plate (8) between the first closing position and a second closing position in which said packing (4) is pressed close between said ring segments (9) and said pressure plate (8), said ring segments (9) being arranged on said closing part (7) such that they are moveable in said directions only when said pressure plate (8) and said base (5) are in their fully closed abutting position, in which position the upper part of the packing (4) just makes contact with the pressure plate (8), **characterized in that** each ring segment (9) is slideably mounted in the pressure plate (8), a spacer member (23) is arranged between each segment (9) and the pressure plate (8), and **in that** the pressure plate (8) has a plurality of receiving spaces (24) for said spacer members (23), which are arranged such that in the first closing position each spacer member (23) is aligned with a receiving space (24) and is received therein during a movement of its associated ring segment (9) to the second closing position.

2. Closing apparatus (1) as claimed in claim 1, **characterized by** control means (18) connected to the ring segments (9) and moveable with respect to the pressure plate (8), said control means (18) including a lever (10) pivotally arranged on the pressure plate (8), a bridge piece (19) pivotally connected to the lever (10) and moveable substantially transversely of the main plane of the pressure plate (8) and pivot arms (20) connecting the bridge piece (19) to the ring segments (9), such that a movement of the bridge piece (19) away from the pressure plate (8) results in the ring segments (9) being moved from their release position to their first and second closing positions, respectively.

3. Closing apparatus as claimed in claim 1 or 2, **characterized in that** the pressure plate (8) is profiled, comprising a rib (27) and an adjacent recess, the peripheral dimensions of which correspond to those of the packing (4).

4. Apparatus (1) as claimed in any one of the preceding claims, **characterized by** a recess (25) arranged in the base (5) for receiving the packing (4) and stops (13) protruding out of the pressure plate (8), wherein the depth of the recess (25) and the height of the stops (13) are geared to each other such that in the closed position of the pressure plate (8) the distance between a bottom surface of the

recess (25) and the pressure plate (8) corresponds with the height of the packing (4).

5. Apparatus (1) as claimed in claim 4, **characterized in by** at least one filler piece arranged in the recess (25).

Patentansprüche

1. Vorrichtung (1) zum Verschließen einer Verpackung (4), die aus einem oberen Teil (3) mit einem nach unten hängenden Rand (16) und einem unteren Teil (2) mit einem vorstehenden Flansch (15) besteht, wobei die Verschließvorrichtung (1) eine Basis (5) mit Haltemitteln (6) zur Halterung der Verpackung (4) in Schließstellung und einen Schließteil (7) aufweist, der gegenüber der Basis beweglich ist, wobei der Schließteil (7) eine Druckplatte (8) und einen Ring (14) aufweist, der aus mehreren Ringsegmenten (9) besteht, die in Radialrichtung im Wesentlichen parallel zur Druckplatte (8) beweglich sind zwischen einer Freigabestellung, in der die Dimensionen in Umfangsrichtung des Ringes (14) größer sind als jene der Verpackung (4) und einer ersten Schließstellung, in der die Dimensionen in Umfangsrichtung des Ringes (14) kleiner sind als jene der Verpackung (4) und wobei die Ringsegmente in einer Richtung im Wesentlichen quer zur Druckplatte (8) beweglich sind zwischen einer ersten Schließstellung und einer zweiten Schließstellung, in der die Verpackung (4) dicht zwischen den Ringsegmenten (9) und der Druckplatte (8) gepresst ist und wobei die Ringsegmente (9) auf dem Schließteil (7) derart angeordnet sind, dass sie in den Richtungen nur dann beweglich sind, wenn die Druckplatte (8) und die Basis (5) in ihrer voll geschlossenen Anschlagstellung befindlich sind, in der der obere Teil der Verpackung (4) gerade mit der Druckplatte (8) in Berührung kommt, **dadurch gekennzeichnet, dass** jedes Ringsegment (9) gleitbar in der Druckplatte (8) gelagert ist, dass ein Abstandsglied (23) zwischen jedem Segment (9) und der Druckplatte (8) angeordnet ist und dass die Druckplatte (8) mehrere Aufnahmeräume (24) für die Abstandsglieder (23) aufweist, die derart angeordnet sind, dass in der ersten Schließstellung jedes Abstandsglied (23) auf den Aufnahmeraum (24) ausgerichtet und darin während der Bewegung des zugeordneten Ringsegmentes (9) in die zweite Schließstellung aufgenommen wird.

2. Verschließvorrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** Steuermittel (18) mit den Ringsegmenten (9) verbunden und gegenüber der Druckplatte (8) beweglich sind, dass die Steuermittel (18) einen Hebel (10) aufweisen, der schwenkbar an der Druckplatte (8) angelenkt ist,

dass ein Überbrückungsglied (19) schwenkbar mit dem Hebel (10) verbunden und im Wesentlichen quer zur Hauptebene der Druckplatte (8) beweglich ist und dass Schwenkarme (20) das Überbrückungsglied (19) mit den Ringsegmenten (9) derart verbinden, dass eine Bewegung des Überbrückungsgliedes (19) von der Druckplatte (8) weg dazu führt, dass die Ringsegmente (9) aus ihrer Freigabestellung in ihre erste Schließstellung bzw. zweite Schließstellung überführt werden.

3. Verschlussvorrichtung nach den Ansprüchen 1 oder 2,

dadurch gekennzeichnet, dass die Druckplatte (8) profiliert ist und eine Rippe (27) und eine benachbarte Ausnehmung aufweist, wobei die Umfangsdimensionen der Ausnehmung jenen der Verpackung (4) entsprechen.

4. Vorrichtung (1) nach einem der vorhergehenden Ansprüche,

dadurch gekennzeichnet, dass eine Ausnehmung (25) in der Basis (5) angeordnet ist, um die Verpackung (4) aufzunehmen und dass Anschläge (13) aus der Druckplatte (8) vorstehen, wobei die Tiefe der Ausnehmung (25) und die Höhe der Anschläge (13) so aufeinander angepasst sind, dass in Schließstellung der Druckplatte (8) der Abstand zwischen der Bodenfläche der Ausnehmung (25) und der Druckplatte (8) der Höhe der Verpackung (4) entspricht.

5. Vorrichtung (1) nach Anspruch 4,

dadurch gekennzeichnet, dass wenigstens ein Füllstück in der Ausnehmung (25) eingesetzt ist.

Revendications

1. Appareil (1) de fermeture d'un conditionnement (4), constitué d'une partie supérieure (3) ayant un bord (16) suspendu vers le bas et une partie inférieure (2) ayant une joue (15) en saillie, ledit appareil de fermeture (1) comprenant une base (5) portant des moyens (6) destinés à maintenir le conditionnement (4) en position de fermeture, et une partie de fermeture (7) disposée afin qu'elle soit mobile par rapport à ce dernier, ladite partie de fermeture (7) comprenant une plaque de pression (8) et une bague (14) constitué de plusieurs segments (9) de bague mobiles en direction radiale sensiblement parallèle à ladite plaque de pression (8) entre une position de libération dans laquelle les dimensions, en direction périphérique, de la bague (14) sont supérieures à celles du conditionnement (4) et une première position de fermeture dans laquelle les dimensions, en direction périphérique, de la bague (14) sont inférieures à celles du conditionnement (4) et mobiles

en direction sensiblement transversale à la plaque de pression (8) entre la première position de fermeture et une deuxième position de fermeture dans laquelle ledit conditionnement (4) est repoussé en position de fermeture entre lesdits segments (9) de bague et ladite plaque de pression (8), lesdits segments (9) de bague étant disposés sur ladite partie de fermeture (7) de manière qu'ils soient mobiles dans lesdites directions uniquement lorsque ladite plaque de pression (8) et ladite base (5) sont dans leur position totalement fermée de butée, dans laquelle la partie supérieure du conditionnement (4) est juste au contact de la plaque de pression (8), **caractérisé en ce que** chaque segment (9) de bague est monté afin qu'il puisse coulisser dans la plaque de pression (8), un organe d'entretoise (23) est placé entre chaque segment (9) et la plaque de pression (8) et **en ce que** la plaque de pression (8) a plusieurs espaces (24) de logement desdits organes d'entretoise (23), qui sont disposés afin que, dans la première position de fermeture, chaque organe d'entretoise (23) soit aligné sur un espace récepteur (24) et soit logé dans celui-ci pendant un déplacement du segment associé (9) de bague vers la seconde position de fermeture.

2. Appareil de fermeture selon la revendication 1, **caractérisé par** un dispositif de commande (18) raccordé aux segments (9) de bague et mobile par rapport à la plaque de pression (8), ledit dispositif de commande (18) comportant un levier (10) qui peut pivoter sur la plaque de pression (8), une pièce formant pontet (19) raccordée de manière pivotante au levier (10) et mobile en direction pratiquement transversale au plan principal de la plaque de pression (8), et des bras de pivotement (20) raccordant la pièce formant pontet (19) aux segments (9) de bague de telle manière qu'un mouvement de la pièce formant pontet (19) dans le sens qui l'éloigne de la plaque de pression (8) ait pour effet que les segments (9) de bague soient déplacés de leur position de libération vers leur première et leur seconde positions de fermeture, respectivement.

3. Appareil de fermeture selon la revendication 1 ou 2, **caractérisé en ce que** la plaque de pression (8) est profilée et comporte une nervure (27) et une cavité adjacente, dont les dimensions périphériques correspondent à celles du conditionnement (4).

4. Appareil (1) selon une quelconque des revendications précédentes, **caractérisé par** une cavité (25) formée dans la base (5) pour recevoir le conditionnement (4) et des organes d'arrêt (13) dépassant de la plaque de pression (8), dans lequel la profondeur de la cavité (25) et la hauteur des organes d'arrêt (13) coopèrent mutuellement afin que, dans la position de fermeture de la plaque de pression (8),

la distance comprise entre la surface inférieure de la cavité (25) et la plaque de pression (8) correspond à la hauteur du conditionnement.

5. Appareil (1) selon la revendication 4, **caractérisé par** au moins une pièce de remplissage logée dans la cavité (25). 5

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FIG.1

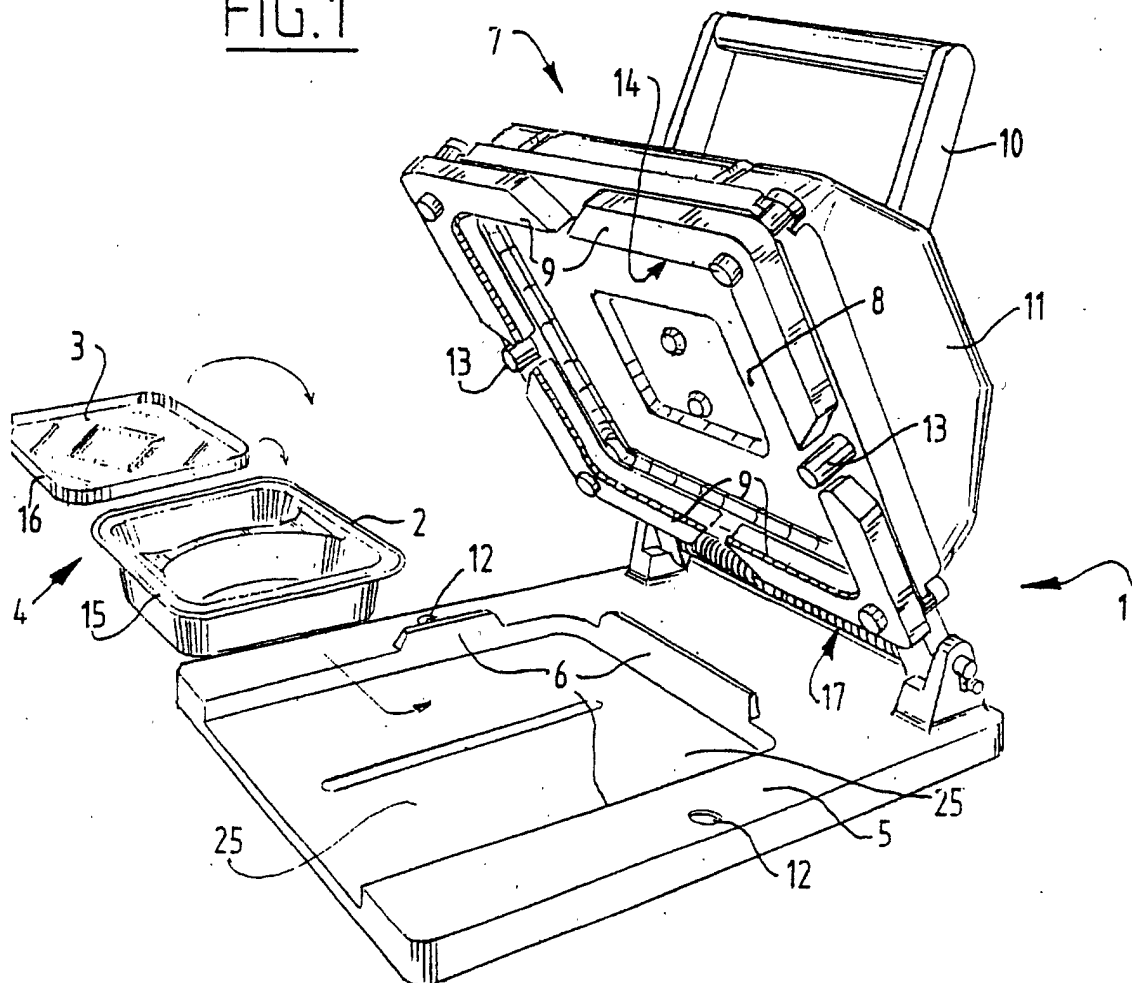
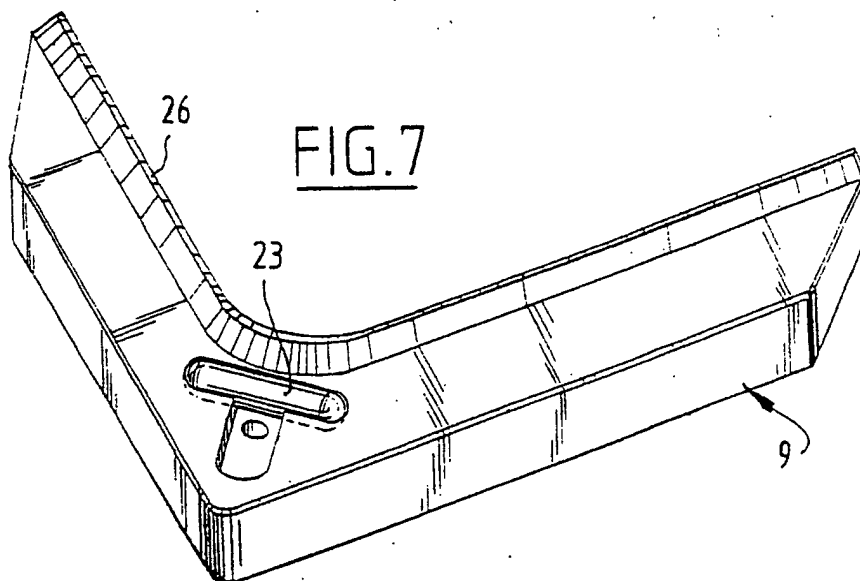
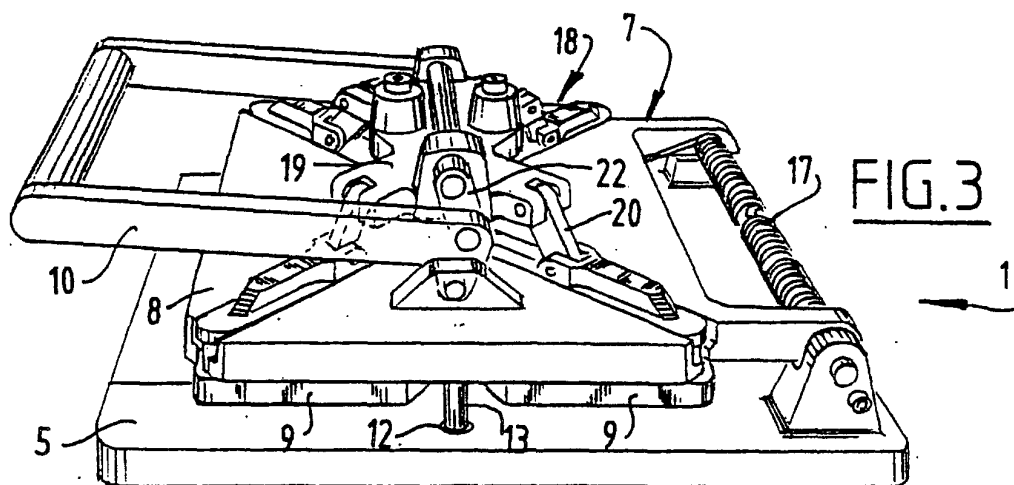
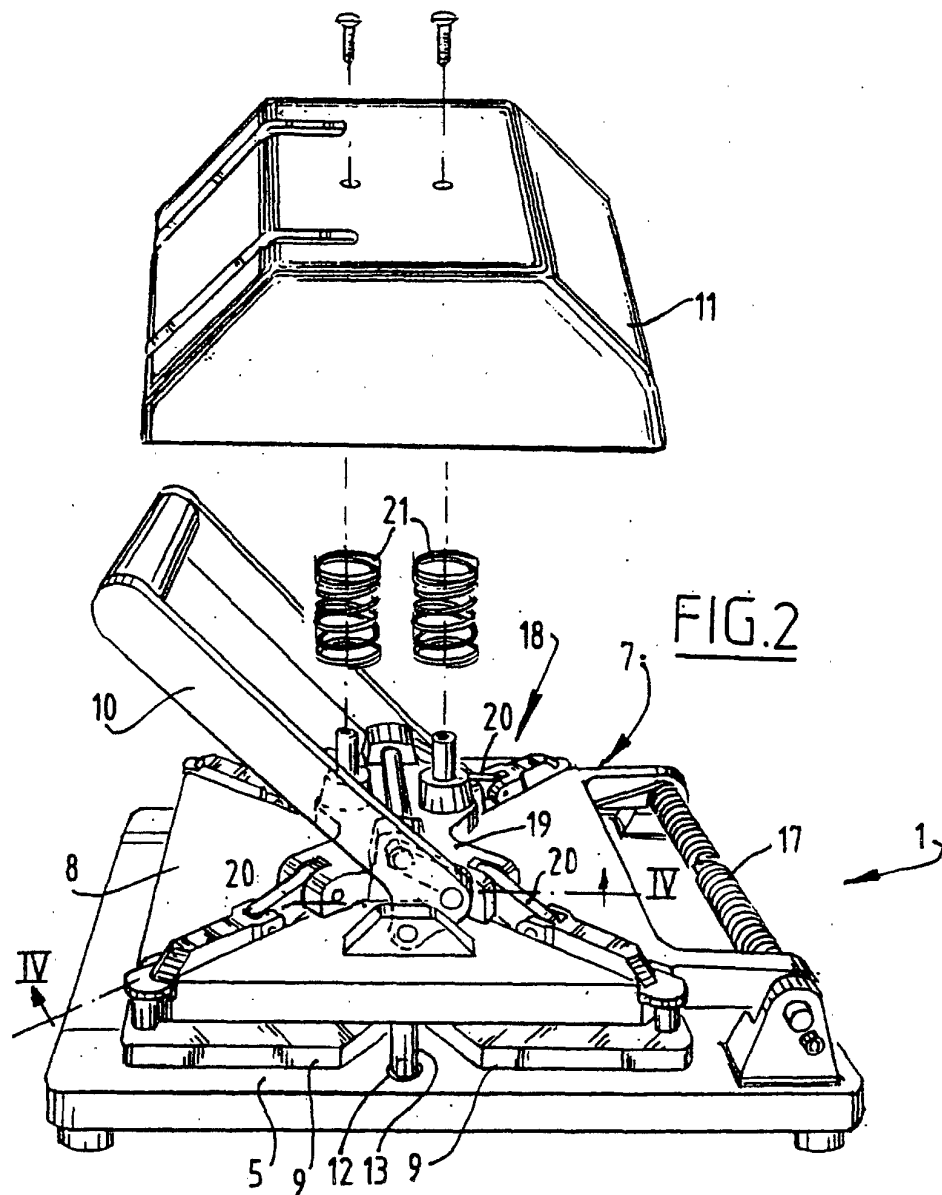
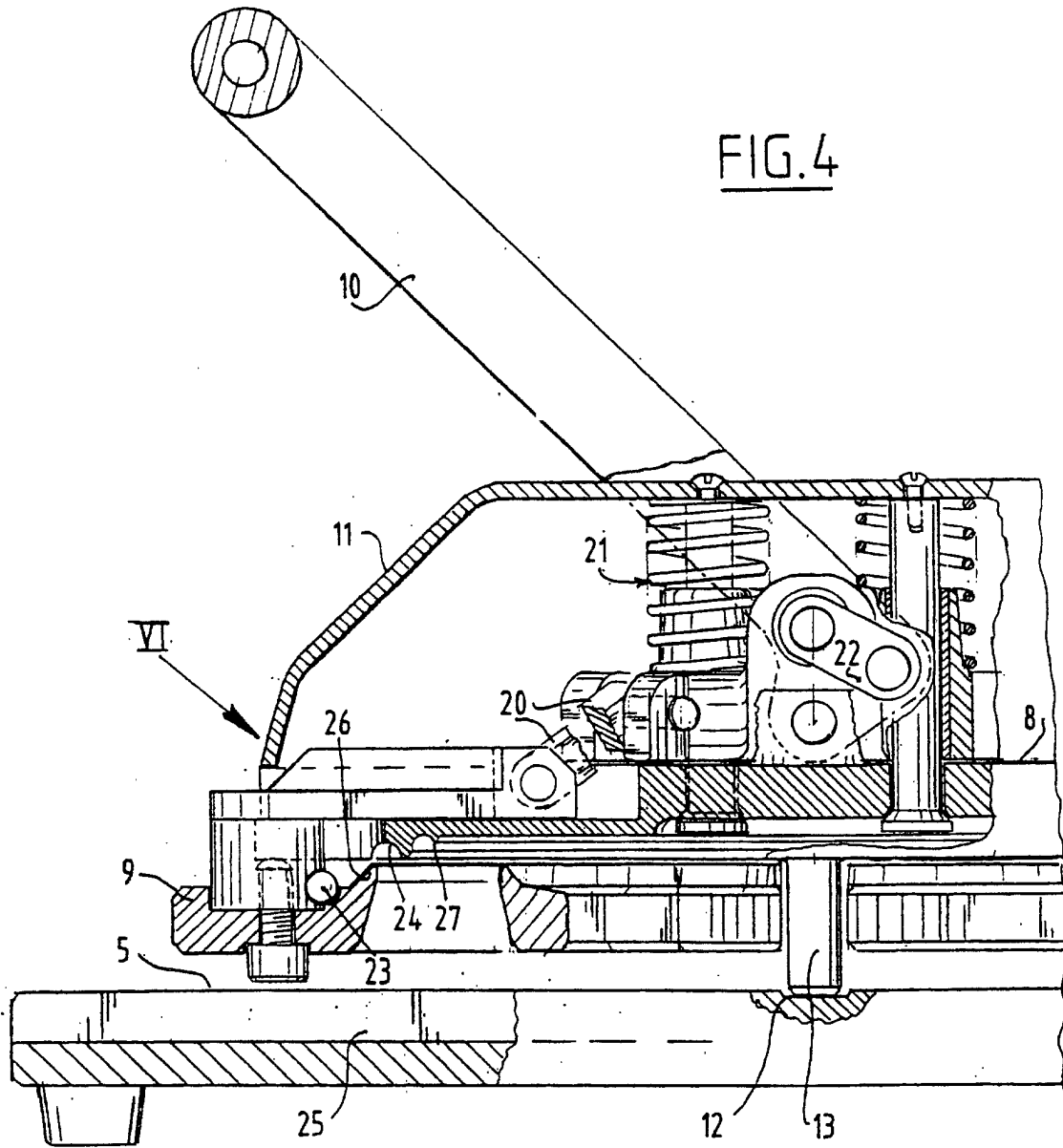


FIG.7







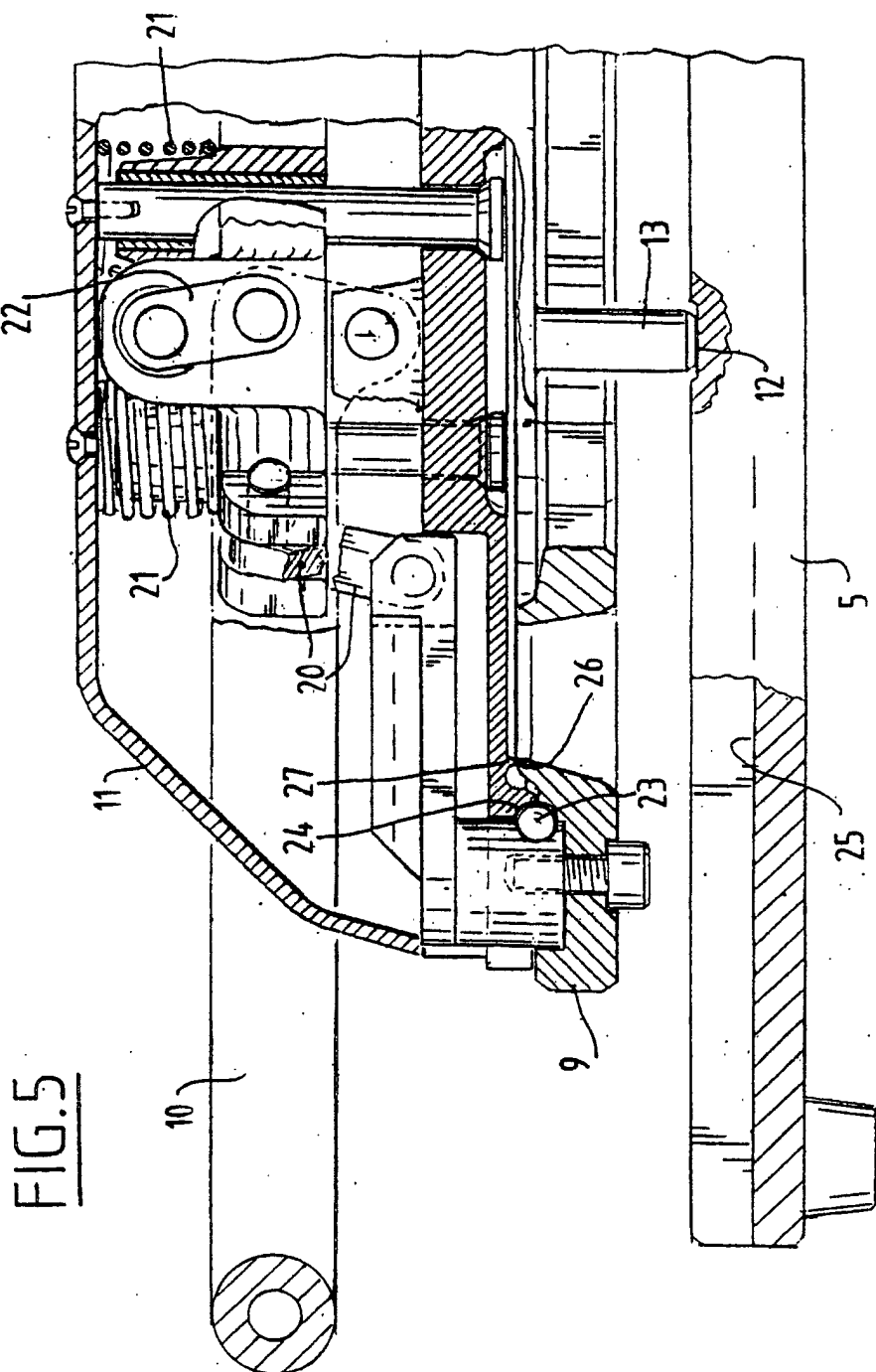


FIG.6A

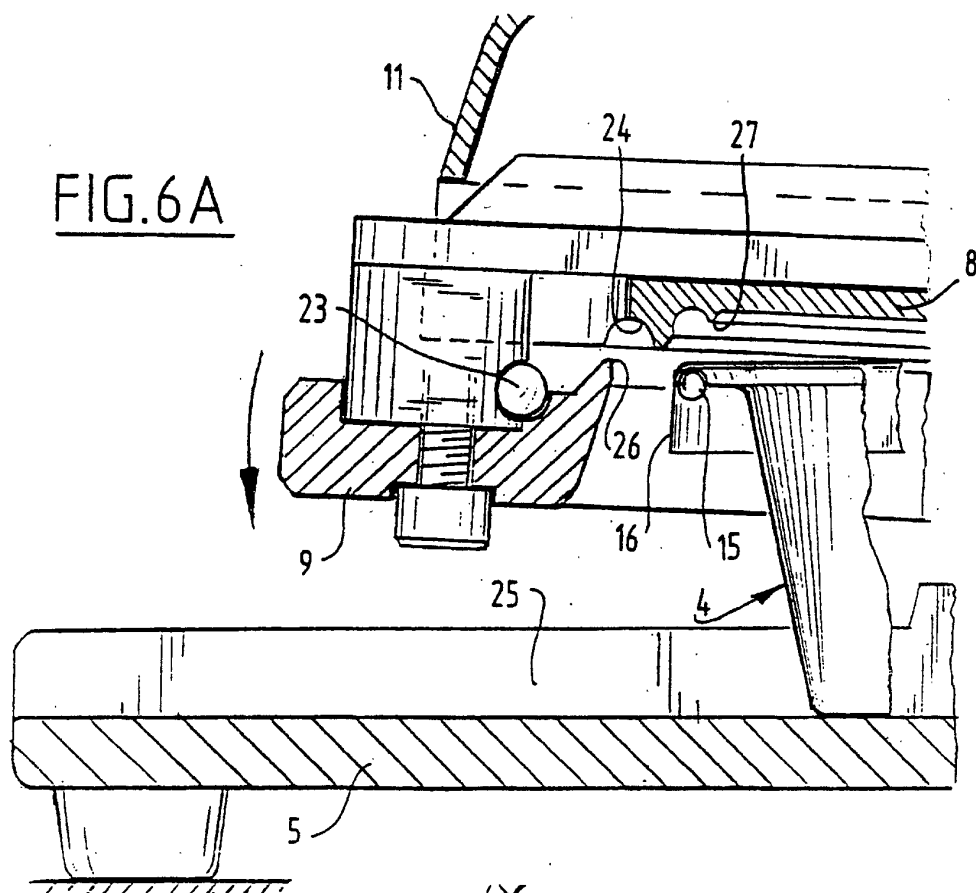


FIG.6B

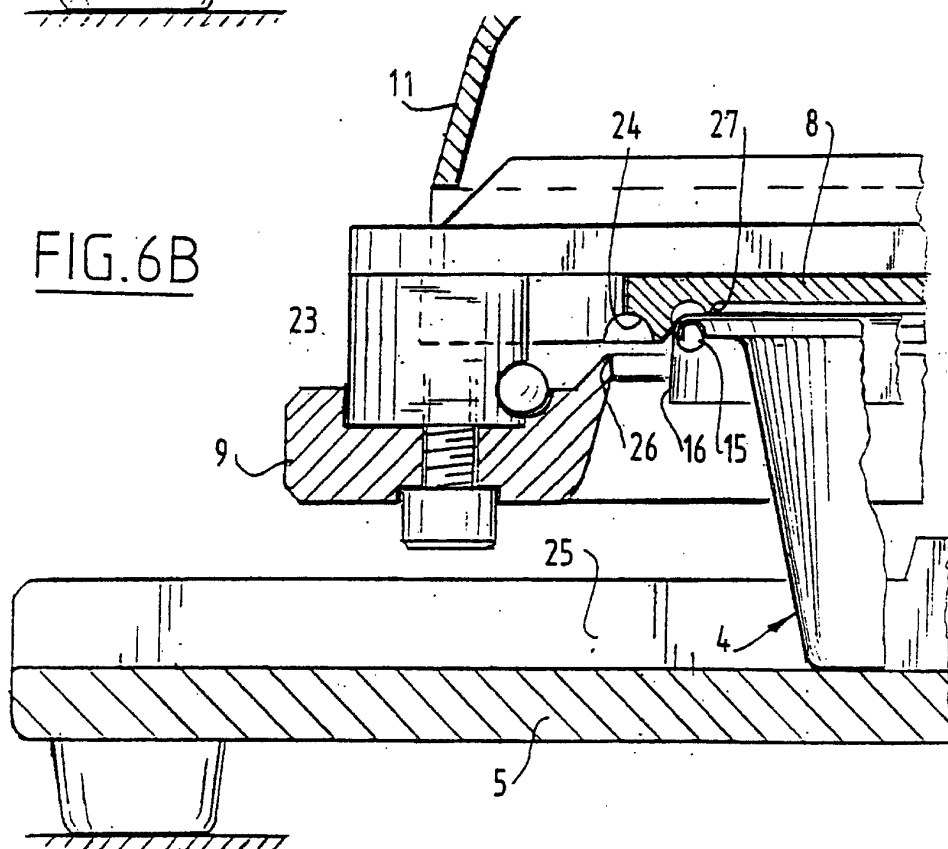


FIG.6C

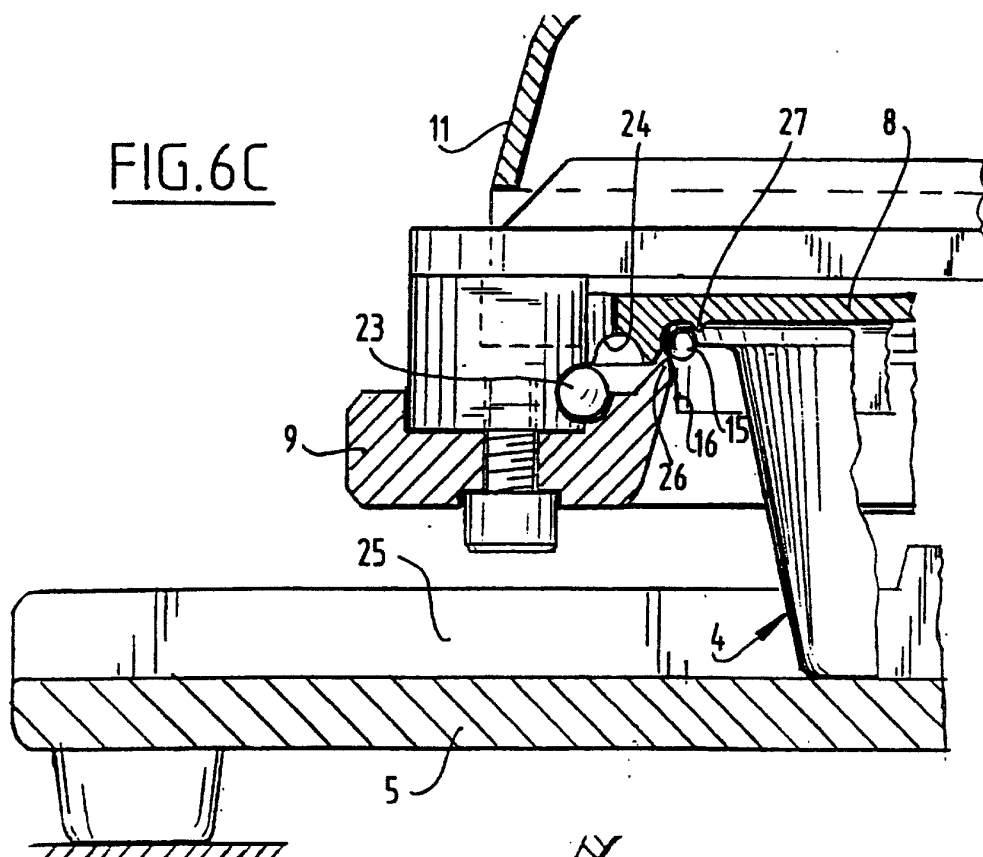


FIG.6D

