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

(11) EP 1 031 303 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.08.2000 Bulletin 2000/35

(51) Int. Cl.[7]: **A47F 3/04**, A47F 3/00

(21) Application number: **99830752.4**

(22) Date of filing: **03.12.1999**

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

(30) Priority: **03.12.1998 IT TS980015**

(71) Applicant:
N.E.M. Nord Est Meccanica S.n.c.
34070 S. Pier D'Isonzo (GO) (IT)

(72) Inventor: **Cianetti, Alessandro**
34170 Gorizia (IT)

(54) Opening system with weight shifting of the plates of counters and display units.

(57) This system can be usefully employed in the sector of refrigerated or non-refrigerated counters, especially in that of counters meant for direct sale of food products.

The plates (1, 2) on the customer's side move longitudinally along a lower carrying section (3) provided with two longitudinal slots (8, 9) with horizontal base and horizontal vault. The base of each slot (8, 9) is provided with a slideway (10, 11) and also the vault is provided with a slideway (12, 13), all extending longitudinally.

Each slot (8, 9) receives a carriage (4, 5); a certain number of bushing holders (14), whereon bushings (15) engage, is connected to the upper and to the lower part of each carriage (4, 5); on each of the bushings (15) engages a wheel (16). Said wheels (16) sliding inside the aforementioned slideways (10, 11, 12, 13).

When the plates (1, 2) are opened the portion of their weight formerly carried by the supporting arms (7) is shifted to the vaults of the aforementioned slots (8, 9) of the carrying section (3).

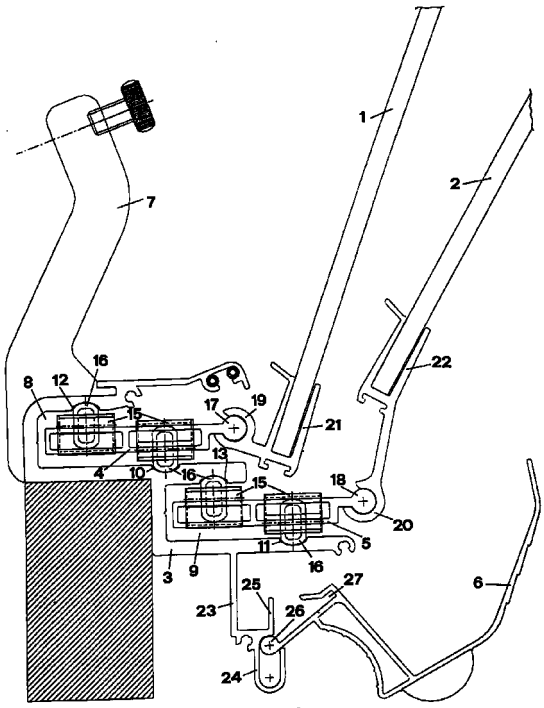

FIG. 4

EP 1 031 303 A2

Description

Technical Field

[0001] This system can be usefully employed in the sector of refrigerated or non-refrigerated counters, especially in that of counters meant for direct sale of food products.

Background Art

[0002] The counters and window displays meant for sale of food products usually have glass or plastic plates, serving as protection from environmental agents for the food products contained therein, therefore avoiding that dust and/or insects come into contact with them. In a different manner, those plates are connected to a lower frame or to an upper frame provided with gas springs (supported by a post) or to both. But, sometimes, the frame provided with the gas springs is not used; for example, this type is commonly used in confectioners' shops. In these cases, the plates are provided with curvatures in the upper part thereof that increase their development and, essentially, their weight, yet providing an excellent view from the top of the displayed products.

[0003] The plates are always connected along their lower side and, in resting position, they abut on fitting vertical supporting arms.

[0004] In order to clean the counter or display internally and in order to insert or extract the food products, the plates provided on the customer's side have to be displaced, at least twice a day. Different moving systems are known of, concerning those plates.

[0005] Naturally, the simplest method being that of lifting them from their frames and putting them on the floor, until the above mentioned daily operations are terminated. But, considering their weight and the fact that they might slip and break, this procedure is applicable to smaller and space-saving plates only.

[0006] Another solution is to hinge the lower side of each plate to its frame, so as to facilitate its displacement, since one side, at least, always remains connected to the counter or window display, therefore the physical effort is diminished. But, not even this solution can solve all problems faced by operators. During the opening of big glass plates towards the lower end thereof, it is compulsory to support them manually, while the cleaning operations and insertion/extraction of food products are accomplished, in order to avoid the breaking of the hinges. The operators' inconvenience is thus twice as much: on one hand, the effort of supporting the glass plates and on the other hand, the effort of not being able to move along the counter or display, being most of it occupied by the opened glass plates.

[0007] Another method is that of using traditional sliding plates. The plates move longitudinally, therefore the effort and the danger to the operators are kept away. But, unfortunately, each plate slides along a suitable slideway with the consequence that the sides of the different plates overlap and thus never match. The feared insects and dust can insert themselves inside the space being between the sides.

Disclosure of invention

[0008] The object of the present invention is that to provide operators with a moving system suitable for plates of counters and displays, allowing for its longitudinal displacement and for the matching of the sides thereof, while the plates are in resting position.

[0009] This object and further objectives are reached by the present invention, which consists of a weight — shifting opening system foreseeing the longitudinal sliding of the glass or plastic plates, on the customers side. The plates shift longitudinally along a lower carrying section. The lower section is provided with two longitudinally extending slots being on a different level from the ground level, with horizontal bases and horizontal vaults. The base of each slot is provided at least with one longitudinally extending slideway. Similarly, in the vault of each slot at least one longitudinally extending slideway is obtained.

[0010] The slideways obtained in the vault of each slot being on vertical planes that are closer to the longitudinal vertical plane passing through the centre of the counter or display, as to the vertical planes passing through the slideways in the base of the slot itself.

[0011] Each slot hosting at least one section serving as a carriage. The number of carriages corresponding to the number of plates and the length of each carriage being equal to or minor than the length of the plates it is connected to.

[0012] A certain number of supports, such as sleeves, glasses, bushing holders and others are connected on the upper and on the lower face of each carriage. A wheel or a roller or other rotary element having its rotary axle orthogonal as to the axle of the above mentioned slideways are pivotally connected to each of these supports. Alternatively, an intermediate element is engaged in each support and at least one rotary element, having its rotary axle orthogonal as to the axle of the aforementioned slideways, is pivotally connected to the former. These wheels and/or rollers and/or other rotary elements slide inside of these slideways.

[0013] The supports are adjustable in height as to the carriages, by means of rotation or other movement. Also, the intermediate elements, eventually being, can be adjusted in height as to the supports and carriages.

[0014] The sections used as carriages end in correspondence to the customer's side with one, preferably cylindrical, longitudinally extending end connected to the rest of each carriage, by means of a branch. Said cylindrical male ends are inserted into the preferably as a hollow half casing shaped female ends of the sections provided with the plate clamping grippers. Alternatively,

the longitudinal ends of the carriages facing the customer's side are female shaped and receive the male ends of the sections provided with the plate clamping grippers. The male or female section ends are connected with the grippers by means of arms of different lengths, so as to allow the lateral matching of the plates.

[0015] The lower carrying section is further provided with a branch, ending with a lower female wing, preferably shaped as a hollow half casing, and with a vertical upper wing.

[0016] The lower wing is received into a cylindrical male end of a cover section of the mechanical portion, while the vertical wing is received into a slot of the section itself.

[0017] Alternatively, the lower carrying section's lower wing is male — shaped and inserted into a lower female wing of the mechanical portion's cover section, whereas the upper vertical male wing of the lower carrying section is replaced by a female slot, receiving a male wing of the mechanical portion's cover section itself.

[0018] The plates being, that perfectly match while in a resting position, are all moving as they are connected to the carriages that can freely shift longitudinally along the entire length of the carrying section, being provided with wheels and/or rollers and/or other rotary elements. When the plates have to be displaced, at least one thereof is being rotated towards the customers side of the counter or window display and displaced above the remaining. This kind of manipulation is easy. As a matter of fact, when the plates are closed their weight is carried by the above mentioned slot bases of the lower carrying section (and on the foreseen supporting arms), whereas when the plates are opened, their weight is shifted to the vaults of the slots. This weight shifting allows for the plates to longitudinally slide along the counter or window display, without having to be held.

[0019] The cover section inhibits the view of the system's mobile parts.

[0020] The plates cannot overturn completely towards the operator, in case of an excessive pulling towards the customer's side. Therefore, operators can manipulate those plates without danger of any kind.

[0021] The weight shifting system described above provides for a maximum containment of the carriages' dimensions. Consequently, the whole mechanical portion takes up little room, providing for doubtless practical advantages, as it does not obstruct the view of the sold product and therefore, provides for an enhanced appearance of the counter or display. Further, the production costs are lowered and the maximum simplicity in production, assembly and usage is achieved. The height adjustment of the supports or intermediate elements allows for a perfect alignment of the sections used as grippers on the customers side and, simultaneously, for balancing the load of the applied forces.

A Brief Description of the Drawings

[0022] Further characteristics and advantages offered by the present invention will be clarified in the description of a particular kind of performance of the above mentioned opening system, which is preferable but not compulsory and is given for illustration purposes only in the enclosed drawings, in which:

- figure 1 shows the cross section of the present opening system's components, used on a counter, during the resting position of the plates;
- figure 2 shows the cross section of the same opening system's components during the moving position of the plates;
- figure 3 shows the enlarged cross section of the opening system's components, during the resting position of the glass plates;
- figure 4 shows the enlarged cross section of the same opening system's components during the moving position of the plates;
- figure 5 shows a perspective view of the two counter plates in a resting position;
- figure 6 shows a perspective view of the same plates as both are lifted;
- figure 7 shows a perspective view of the same plates as one of them overlaps the other;
- figure 8 shows an enlarged perspective view of one of the carriages.

Mode for Carrying Out the Invention

[0023] In this example more specifically, on a counter the above mentioned weight shifting opening system foresees the usage of two glass plates 1, 2 that are provided on the customer's side, of a lower carrying section 3, of two carriages 4, 5, of the cover section 6 of the mechanical portion and of the plates 1, 2 supporting arms 7. The counter is not provided with an upper section and when the plates 1, 2 are closed they lean on the knobs provided on the arms 7.

[0024] The lower section 3 is provided with two slots 8, 9, extending longitudinally and approximately shaped as a U bent at 90°, with horizontal bases and horizontal vaults.

[0025] One of the slots 8 is provided at a higher level as to the level of the other slot 9 as to the ground level. In the base of each slot 8, 9 a longitudinally extending slideway 10, 11 is provided for. Similarly, in the vault of each slot 8, 9 a longitudinally extending slideway 12, 13 is provided for.

[0026] The slideway 12 obtained in the slot's 8 vault is placed on a vertical plane closer to the longitudinal plane passing through the counter's centre as to the vertical plane passing through the guide 10 provided in the base of the slot 8 itself. The same happens for slot 9, where the slideway 13 obtained in the vault is provided on a vertical plane closer to the vertical longitudi-

nal plane passing through the counter's centre as to the vertical plane passing through the guide 11 provided in the base. The two sections serving as carriages 4, 5 are received inside those slots 8, 9. Two supports, being bushing holders 14, are screwed inside the upper face of the carriages 4, 5 and two supports, being bushing holders 14, are screwed inside the lower face of the same carriages 4, 5. Each bushing holder 14 is a sleeve with inner and outer screw threaded. Each bushing holder 14 receives a bushing 15 provided with a wheel 16 having the rotary axle orthogonal as to the slideways 10, 11, 12, 13 axle. The wheels 16 of the carriages 4, 5 slide inside those slideways 10, 11, 12, 13.

[0027] The sections used as carriages 4, 5 end in correspondence to the customer's side of the counter, with one cylindrical longitudinal end 17, 18 connected to the rest of each carriage 4, 5, by means of a branch. Said cylindrical ends 17, 18 are inserted into the ends 19, 20 — that are shaped approximately as a hollow half casing — of the sections provided with the plates 1, 2 clamping grippers 21, 22. The arms connecting the ends 19, 20 to the grippers 21, 22 being of different lengths, so as the two plates 1, 2 match perfectly, when closed. The carrying section 3 is further provided with a lower branch 23 ending with a lower wing 24, shaped as hollow, laterally flattened half casing and with a vertical upper wing 25. The cylindrical end 26 of the mechanical portion' cover section 6 is fitted into the lower wing 24, whereas the vertical wing 25 is received in a slot 27 thereof, shaped approximately as an upside — down "U" of the same cover section 6.

[0028] When both plates 1, 2 are closed, they are placed side by side and match perfectly.

[0029] Their weight is carried by the sliding wheels 16 inside the slideways 10, 11 provided inside the base of the slots 8, 9 and by both supporting arms 7. If the plates 1, 2 are to be moved from their position, it is first of all necessary to open the mechanical portion's cover section 6. In order to do this, this last one has to be seized and lifted vertically so as its slot 27 does not receive the vertical wing 25 of the section 3 anymore and its cylindrical end 26 reascends inside the semi — cylindrical wing 24 of the section 3 itself. Thus, the section 6, disengaged in its upper portion from the section 3 can rotate due to its weight towards the customer's side, having the fulcrum point in the axle of symmetry of the cylindrical end 26. Then, the two plates 1, 2 are seized from the upper part thereof and pulled towards the customer's side. The rotation of each plate 1, 2 having the fulcrum point in the longitudinal axle passing through the centre of the corresponding cylindrical end 17, 18 of the carriages 4, 5.

[0030] The rotation ends when the disengaged lower side of the semi — cylindrical ends 19, 20 of the sections provided with the grippers 21, 22 barges against the arms of the carriages 4, 5 ending with the cylindrical ends 17, 18.

[0031] When both plates 1, 2 are open, their weight is still carried by the bases of the slots 8, 9 of the section 3, by means of the wheels 16 sliding inside the slideways 10, 11. But the weight force factor of the plates 1, 2, once carried by the two supporting arms 7, is now shifted to the vaults of the aforementioned slots 8, 9, by means of the wheels 16 sliding inside the upper slideways 12, 13. As a matter of fact, double levers are formed having the fulcrum point in the symmetric longitudinal vertical planes of the wheels 16, sliding inside the lower slideways 10, 11. Those levers having as arms, respectively, the segments extending from these latter planes to the symmetric longitudinal vertical planes of the cylindrical ends 17, 18 of the carriages 4, 5 and the segments extending from the symmetric longitudinal vertical planes of the wheels 16, sliding inside the slideways 10, 11 to the symmetric longitudinal vertical planes of the wheels 16 sliding inside the slideways 12, 13. From there, it is possible to shift the carriages 4, 5 along the entire length of the section 3, by displacing the plate 2 above the plate 1. As a matter of fact, the wheels 16 are fixed upon the carriages 4, 5 and, consequently, the former can freely shift longitudinally along the entire section 3 length. The displacement of the plate 2 from its initial position allowing for access to the matching interior part of the counter, in order to perform the usual daily operations.

[0032] Following this, both plates 1, 2 coupled and overlapped are made sliding until they reach the position initially occupied by the plate 2, disengaging the second part of the counter. After performing the cleaning and/or insertion/removal operations of the food products in this half, as well plate 1 or plate 2 is shifted until it occupies the disengaged portion of the counter. In order to bring the plates 1, 2 back in position, they are seized by their upper part and rotated towards the shop assistant's side, until they rest on the knobs of the supporting arms 7.

[0033] Also, the carrying section 6 is rotated and then pushed downwards, so as its slot 27 engages the vertical wing 25 of the section 3 and its cylindrical end 26 is positioned on the bottom of the semi — cylindrical depression, limited by the wing 24 of the section 3.

[0034] Thus engaged on the section 3, the section 6 cannot move anymore.

[0035] Also, the carriages 4, 5 (and, consequently, the plates 1, 2) can be positioned in an inverted position as of the one initially occupied.

[0036] The plates 1, 2 cannot overturn completely towards the operator, in case of excessive pulling towards the customers side, as the wheels 16 sliding inside the slideways 12, 13 act as stops and avoid this to happen. Therefore, operators can move those plates 1, 2 without any kind of danger.

[0037] The bushings 15 are adjustable in height as to the bushing holders 14 and the bushing holders 14 are adjustable in height as to the carriages 4, 5. This happens, by means of the clockwise and counterclockwise screw.

Claims

1. Opening system with a weight shifting of the plates of counters and display units that are not provided with an upper carrying section in which the glass or plastic plates (1, 2) on the customer's side move longitudinally along a lower carrying section (3), characterised by the fact that said lower section (3) is provided with two longitudinally extending slots (8, 9) provided with horizontal bases and horizontal vaults; one of the two slots (8) is fitted at a higher level as to the level of the other slot (9); in the base of each of the aforementioned slots (8, 9) at least one longitudinally extending slideway (11, 12) is provided and, similarly, in the vault of each slot (8, 9) at least one longitudinally extending slideway (11, 12) is provided, also; the slideway (12) provided in the slot's vault (8) is fitted on a vertical plane closer to the vertical plane longitudinally passing through the centre of the counter or display as to the vertical plane passing through the slideway (10) provided inside the slot (8) itself; similarly, inside the second slot (9) the slideway (13) provided in the vault is filled on a vertical plane closer to the vertical longitudinal surface passing through the centre of the counter or display as to the vertical plane passing through the slideway (11) provided in the base of the slot (9) itself; each slot (8, 9) receiving at least one section used as a carriage (4, 5); the number of carriages (4, 5) matches the number of plates (1, 2) and their length is equal or minor to the length of the plate (1, 2) to which it is connected; a certain number of supports, such as sleeves, glasses, bushing holders (14) or other are connected to each carriage (4, 5), as in the upper as in the lower side thereof; an intermediate element such as a bushing (15) engages in each support; to intermediate element one rotary element, at least, such as a wheel (16) or a roller is pivotally connected to; the rotary element has the rotary axle orthogonal as to the axle of the aforementioned slideways (10, 11, 12, 13); the wheels (16) or rollers or other rotary elements slide inside those slideways (10, 11, 12, 13); said supports are adjustable in height, by means of rotation or other movement as to the carriages (4, 5), whereby said intermediate elements can be adjustable in height as to the supports as well as to the carriages (4, 5); the sections used as carriages (4, 5) end in correspondence to the customer's side with one male, preferably cylindrical, longitudinally extending end (17, 18) connected to the rest of each carriage (4, 5), by means of a branch; said male ends (17, 18) being fitted inside the female ends (19, 20), preferably shaped as a hollow semi — cylinder, of the sections provided with the grippers (21, 22) for clamping the plates (1, 2); the ends (19, 20) are connected to the grippers (21, 22) by means of arms having a different length, so as to allow for the lateral matching of the plates (1, 2) when these are closed; the carrying section (3) being further provided with a lower branch (23) ending with a lower female wing (24), preferably shaped as a hollow half casing and with an upper vertical male wing (25); the lower wing (24) receiving a preferably cylindrical male end (26) of a mechanical portion's cover section (6), whereas the vertical wing (25) is received by a female slot (27) of the section (6) itself.

2. Opening system as by Claim 1, characterised by the fact that said wheel (16) or roller or other rotary element can be directly connected pivotally to one of said supports.

3. Opening system as by Claim 1 characterised by the fact that the longitudinal carriage (4, 5) ends (17, 18), facing the customer's side can be shaped as female and receive the male ends (19, 20) of the sections provided with grippers (21, 22) for clamping plates (1, 2).

4. Opening system as by Claim 1 characterised by the fact that the carrying section's (3) lower wing (24) can be shaped as male and inserted into a lower female wing (26) of the mechanical portion's covering section (6), whereas the vertical upper wing (25) of the carrying section (3) can form a female slot (27) and receive a male wing (27) of the mechanical portion's cover section (6) itself.

5. Opening system as by Claim 1, where the closed plates (1, 2) lean on usual supporting arms (7), characterised by the fact that the rotation of the plates (1, 2) is accomplished when the ends (19, 20) of the sections provided the grippers (21, 22), facing the counter or display, barge against the projecting arms of the carriages (4, 5); when said plates (1, 2) are open, the portion of their weight formerly carried by the supporting arms (7) is shifted to the vaults of said slots (8, 9) of the carrying section (3), by means of the rotary elements sliding inside the slideways (12, 13) provided therein; as a matter of fact, with open plates (1, 2), double levers are formed having as fulcrum the longitudinal vertical symmetry planes of the rotary elements sliding inside the slideways (10, 11) of the slots' (8, 9) bases and having as arms, respectively, the segments extending from the latter planes to the vertical longitudinal symmetry planes of the ends (17, 18) of the carriages (4, 5) and the segments extending from the vertical longitudinal symmetry planes of the rotary elements sliding inside the slideways (10, 11) to the vertical longitudinal symmetry planes of the rotary elements sliding inside the slideways (12, 13) of the vaults of the slots (8,

9); thus, said carriages (4, 5) can be shifted along the entire length of the section (3), by displacing a plate (2) above another plate (1).

6. Opening system, as by Claims 1, 4 and 5, characterised by the fact that in order to open the mechanical portion' cover section (6) it is necessary to lift it first, so as its slot (27) does not receive the vertical wing (25) of the section (3) anymore and its cylindrical end (26) reascends inside the semi — cylindrical wing (24) of the section itself (3); the section (6), thus disengaged in its upper portion can, therefore, rotate towards the customer's side having a fulcrum point in the symmetry axle of the cylindrical end (26).

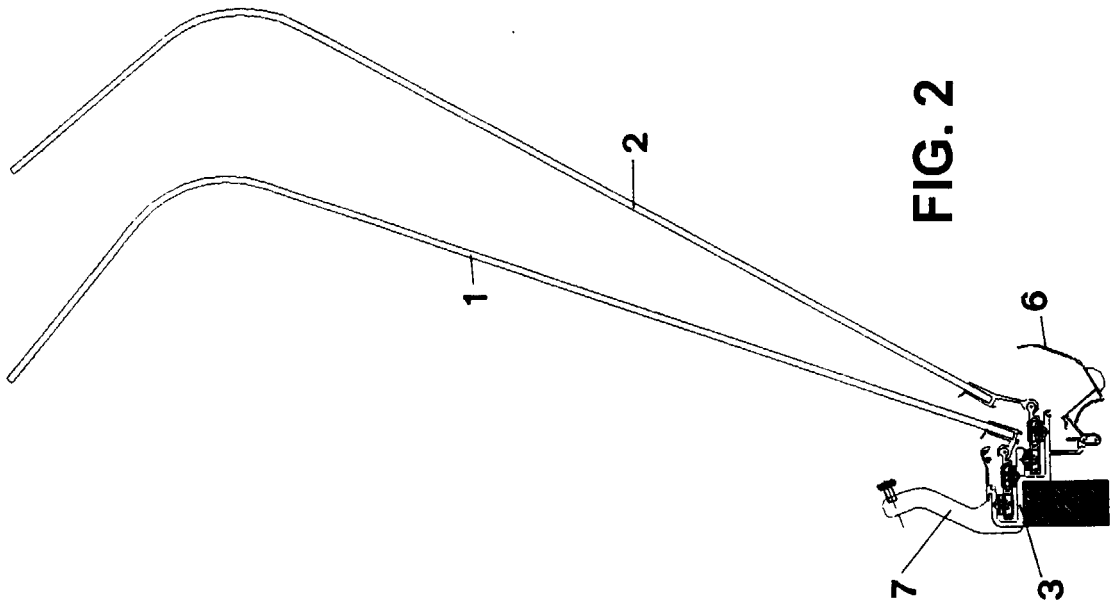

FIG. 2

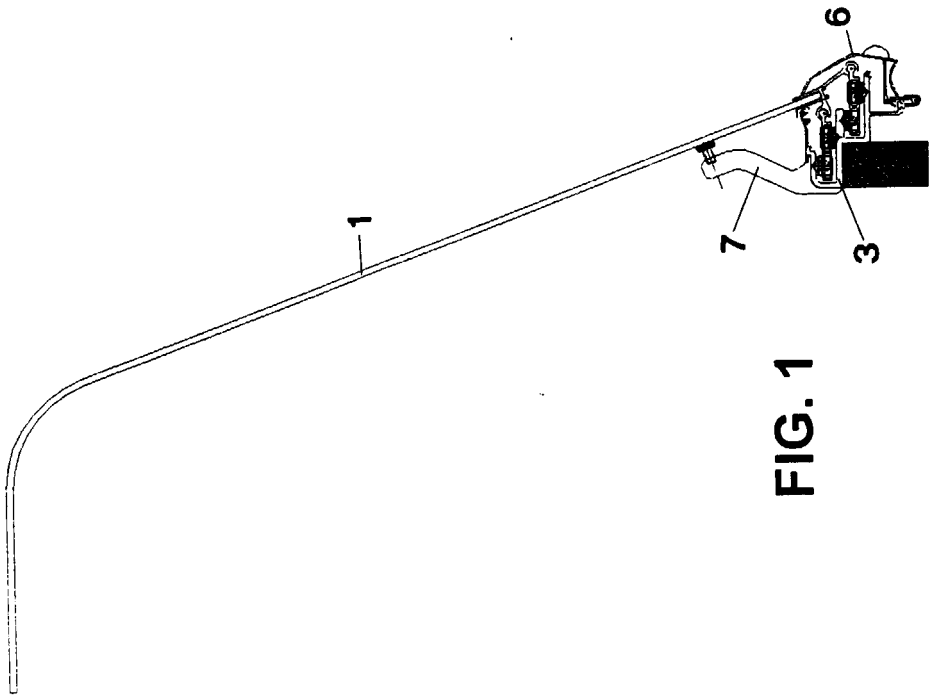

FIG. 1

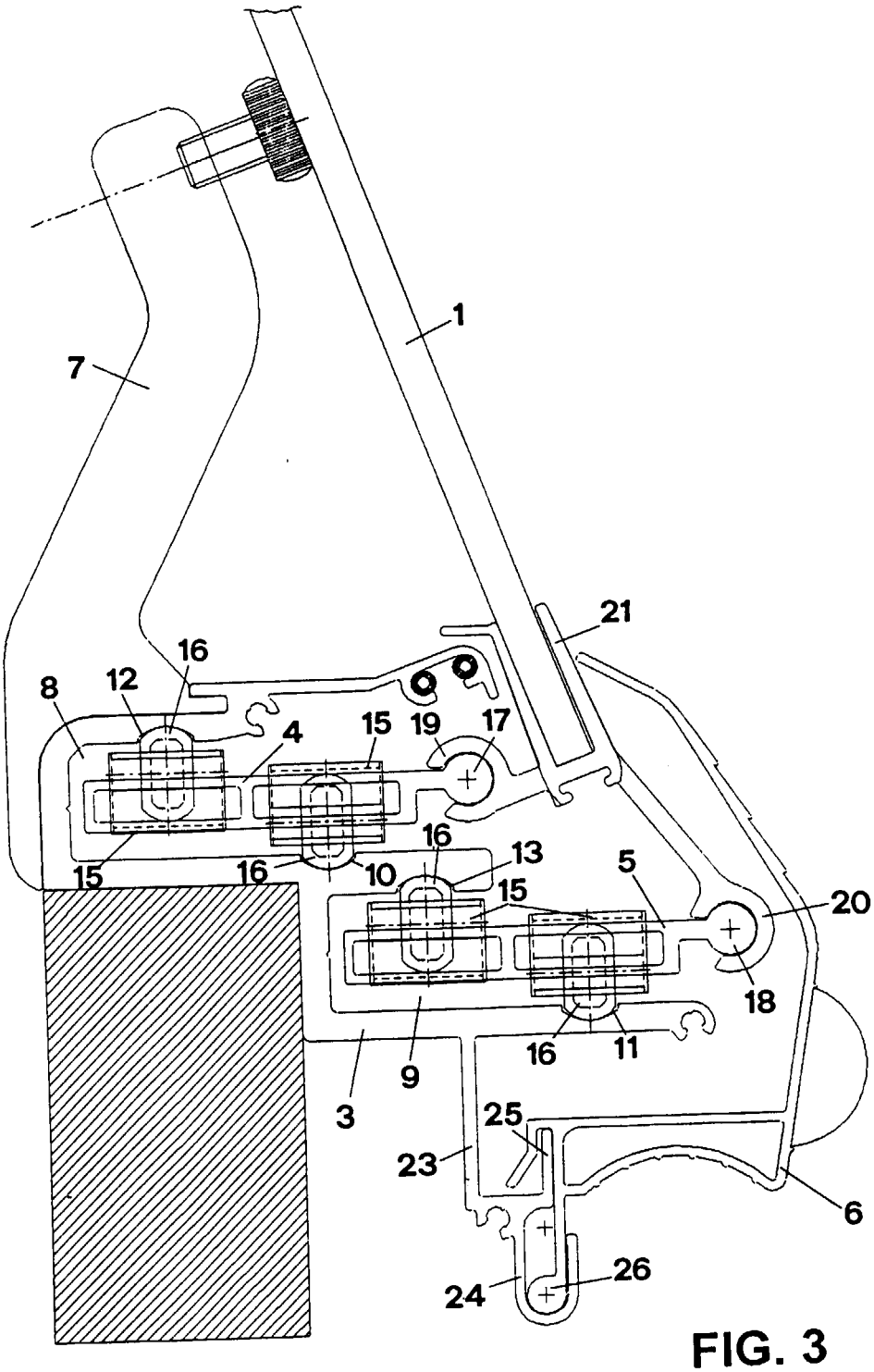

FIG. 3

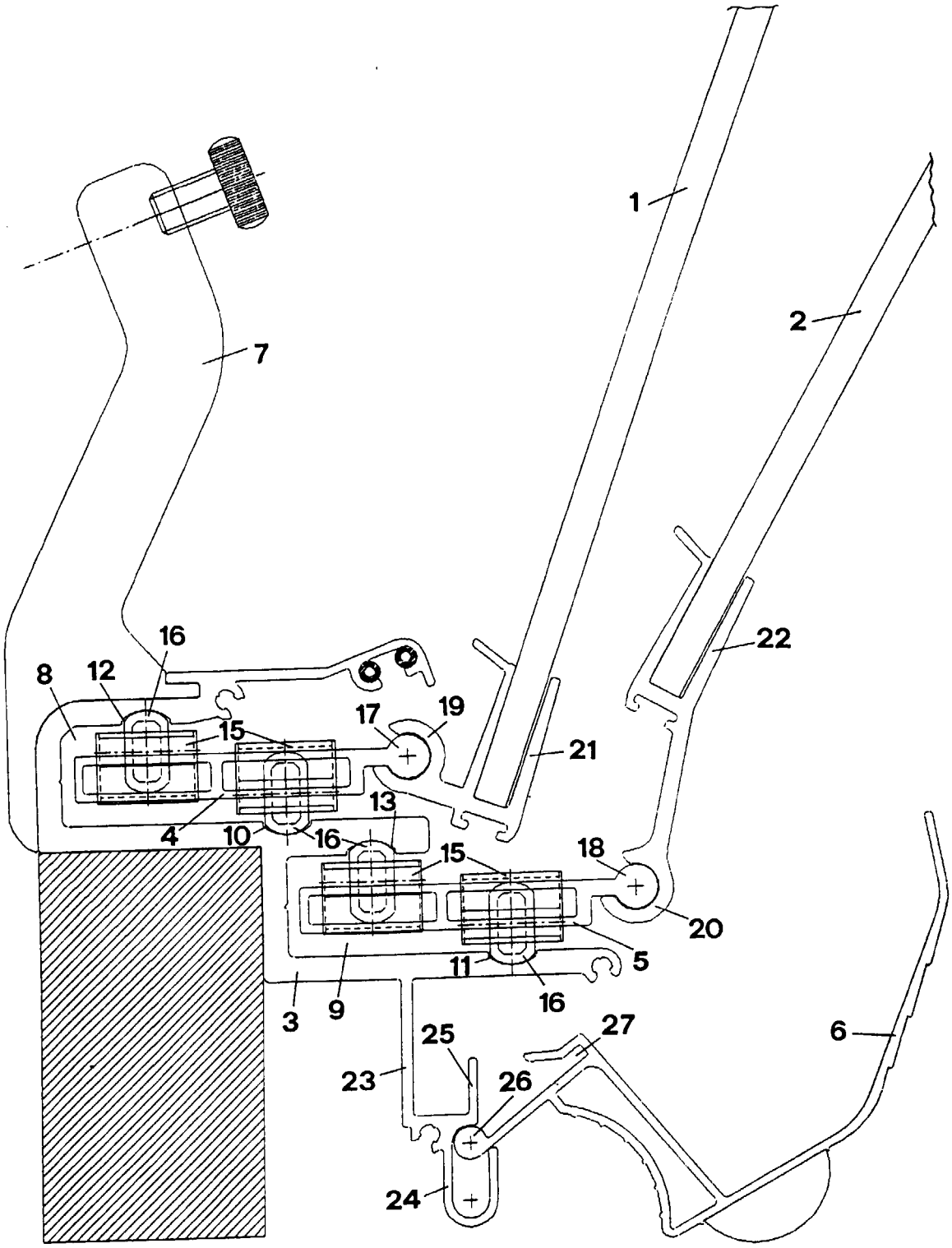

FIG. 4

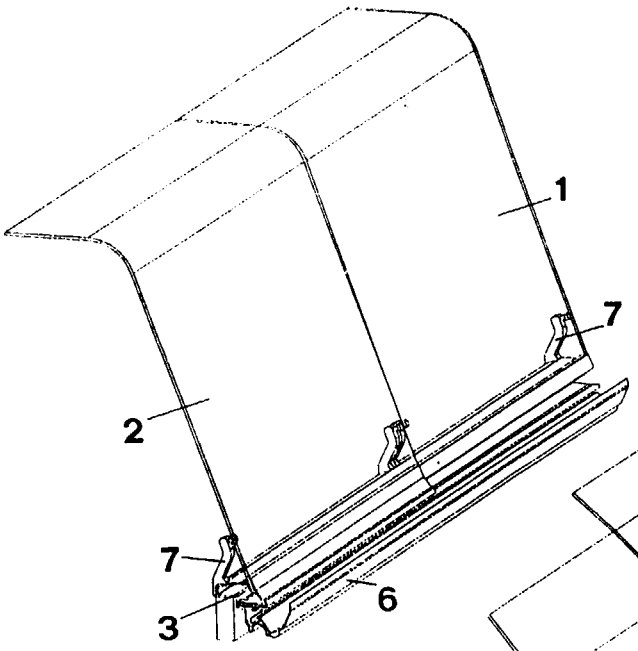

FIG. 5

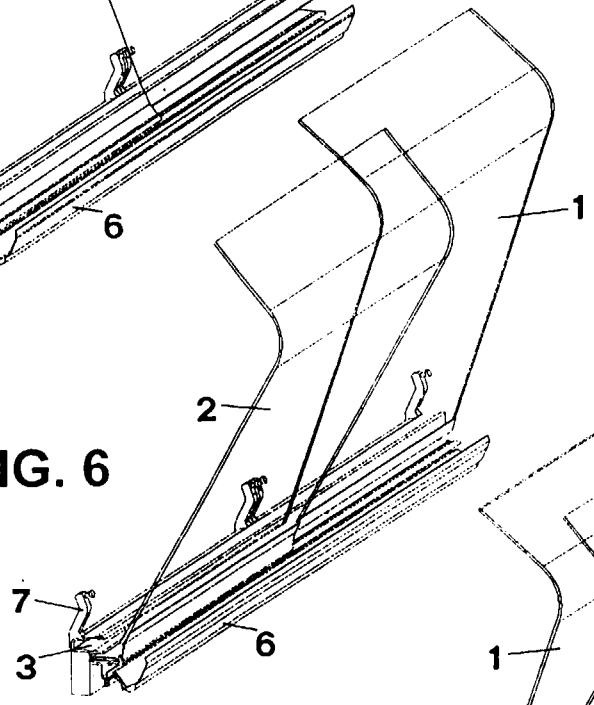

FIG. 6

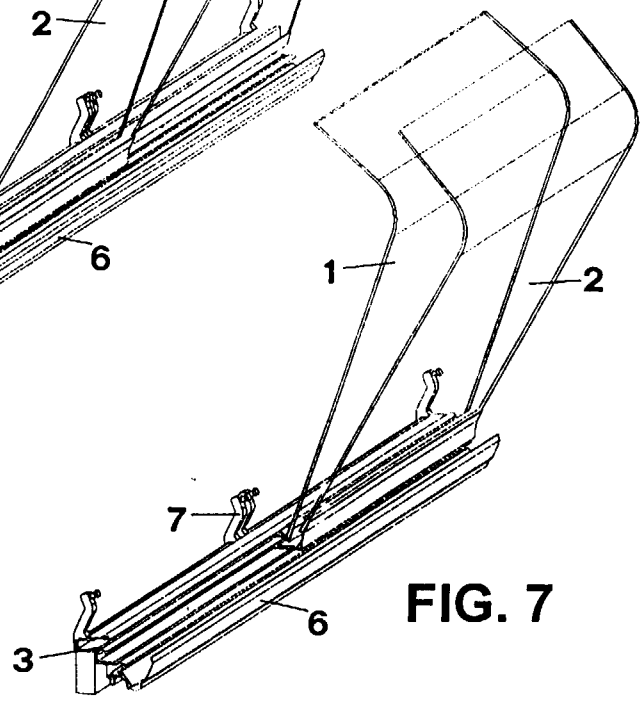

FIG. 7

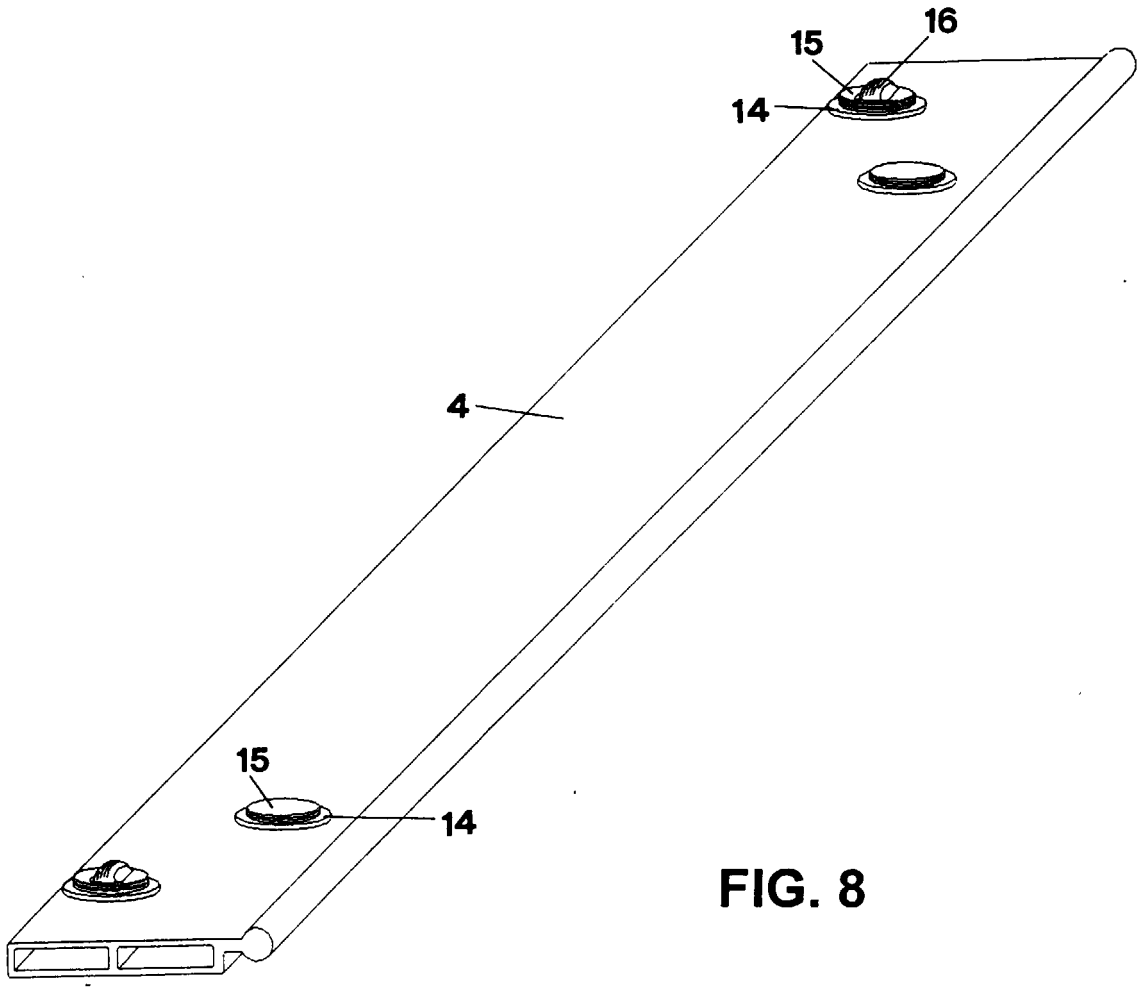

FIG. 8