A slider for actuating profiled closure tracks, especially for a bag, having a base and two flanks parallel to a median central longitudinal plane and configured for stressing the profiled closure tracks between a closed latch position and an open separated position. A longitudinal rib subdivides the internal space of the slider into two non-parallel channels. A first axial end of the channels wherein the channels are convergent makes an input end of the channels, while a second axial end of the channels wherein the channels are divergent makes an output end of the channels.
SLIDER FOR ACTUATING PROFILED CLOSING SHAPES WITH PREFERRED FOLD LINES

FIELD OF THE INVENTION

[0001] The present invention relates to the field of sachets or bags provided with complementary profiled closure shapes or tracks, actuated by a slider.

[0002] It relates more precisely to a slider for actuating profiled closure shapes or tracks for a closure assembly equipping a sachet or bag.

BACKGROUND OF THE INVENTION

[0003] Numerous sachets with complementary profiled closure shapes equipped with sliders have already been proposed.

[0004] The attached FIGS. 1A and 1B illustrate an example of a slider 1 in accordance with the prior art.

[0005] FIG. 1A is an end view of a slider of the prior art while FIG. 1B is a sectional view of the same slider along line B-B.

[0006] In these FIGS. 1A and 1B, the profiled shapes or tracks with which the slider is supposed to cooperate have been illustrated and bear the reference P1 and P2, whereas the sachet with which these profiled shapes are associated is referenced S. The sachet or bag S comprises two main sheets S1 and S2 bearing respectively one of the two tracks P1 or P2.

[0007] Such a slider 1 is made of moulded plastic material and has a generally known structure.

[0008] More precisely, this slider has a cross-section in an inverse “U” shape, and comprises a base 10 to which are connected two lateral and parallel wings 11 and 12 known as “flanks”. The longitudinal axis of the slider corresponds to its direction of movement when it is installed on a sachet with complementary profiled shapes. The flanks 11 and 12 extend parallel to this axis.

[0009] As is well known per se, the internal space of the slider encloses means 13 adapted for stressing the complementary profiled closure shapes P1 and P2 of the sachet, by moving towards or moving away according to the direction of displacement of the slider along these profiled shapes. The expression “internal space” means the space delimited by the base 10 and the flanks 11 and 12.

[0010] As illustrated on FIG. 1B, such means 13 comprises generally a central rib 13C between two lateral channels or corridors 13A and 13B receiving respectively a part of one of the two tracks P1 and P2. The channels 13A and 13B are not parallel. The channels 13A and 13B are convergent towards an axial end AE1 of the slider and are divergent towards the opposite axial end AE2.

[0011] When the slider is moved with the first axial end AE1 forwards, the complementary tracks P1 and P2 are stressed away and the bag is put in an open position, while when the slider is moved with the second axial end AE2 forwards, the complementary tracks P1 and P2 are stressed towards and the bag is put in a closed latch position.

[0012] Such a slider must be placed on a sachet S whereof the two main sheets S1 and S2 are provided with complementary profiled closure shapes P1 and P2.

[0013] The technique generally utilised to achieve this consists overall in deforming the slider so as to momentarily move its flanks 11 and 12 away from one another (arrow f of FIG. 1A), moving the profiled shapes closer to “cinch” the latter and trap the protuberances T1 and T2 with which they are provided, then return the flanks to their initial position (arrows g of FIG. 1A).

[0014] This displacement of the flanks is implemented for example by introducing tools “inside” the slider, applying them against the inner faces of the flanks and moving them away mutually.

[0015] In practice, the pivoting movement of the flanks does not operate by flexion of the material of the slider in the attachment zone of the flanks 11, 12 to the base 10. In fact, this zone is too thick and rigid to constitute a preferred folding zone.

[0016] In this case, deformation is completed in predetermined regions of the base. More precisely generally deformation of the slider for opening the slider is operated by pivoting the flanks 11, 12 of the slider along respective pivoting lines P1 and P2 corresponding respectively to the median plane of the non parallel channels 13A and 13B. As a consequence the pivoting lines P1 and P2 are not parallel and when opening the slider the flanks 11 and 12 do not remain parallel. Consequently the first axial end AE1 of the slider is less opened than the second axial end AE2. This difference of opening between the two ends of the slider leads to some difficulties in placing the slider upon the complementary tracks P1 and P2.


[0018] Also, U.S. Pat. No. 6,584,666 describes a slider provided with load pins.

[0019] Prior art documents U.S. Pat. No. 6,611,996 and U.S. Pat. No. 6,419,391 disclose other embodiments of slider in accordance with the prior art.

SUMMARY OF THE INVENTION

[0020] The aim of the present invention is to further improve sliders of the prior art so as to produce satisfactory deformation with a level of acceptable mechanical stress, without risk of breaking.

[0021] Another aim of the invention is to provide a new slider allowing easier insertion upon complementary tracks.

[0022] The present invention accordingly relates to a slider for actuating profiled closure shapes or tracks, especially for a closure assembly equipping a sachet or bag, comprising a base, two flanks parallel to a median central longitudinal plane, and means adapted for stressing respectively said profiled closure shapes or tracks, by moving towards or moving away according to the direction of displacement of the slider along profiled shapes or tracks, for moving the profiled shapes between a closed latch position and an open separated position, and comprising a longitudinal rib which subdivides its internal space into two non parallel corridors or channels.

[0023] This slider is characterized in that a first axial end of the channels wherein the channels are convergent making input end of the channels while a second axial end of the channels wherein the channels are divergent making output end of the channels, the external edge of the input end of the channels is at a distance of the median central longitudinal plane at least equal to the distance separating the internal edge of the output end of the channels from the median central longitudinal plane and the wall of the base in regard of the channels corresponds to the lower thickness of the slider.

[0024] As explained below with the above feature, the present invention warrants that the two flanks are pivoted along parallel axes and consequently that the flanks remain
parallel when opening the slider. Consequently inserting the slider upon the complementary tracks is easier than with the slider in accordance with the prior art.

According to other advantageous and non-limiting characteristics:

- The slider of the invention comprises central rib which is prolonged by a base which overflows on either side of said rib to constitute guide facets of said profiled shapes or tracks;
- Said base overflows on either side of said rib to constitute guide facets of a protuberance associated with said profiled shapes;
- Along the longitudinal free edge of each flank extends a stiffening bar, of a thickness greater than that of said flank;
- Said bar has the same longitudinal range as said flank; and
- It comprises projecting load pins on said flanks, in the vicinity of the end of those opposite said base, for opening it provisionally and enabling its engagement on said profiled shapes when stress is exerted on said pins.

The invention relates also to a bag including such a slider.

Other characteristics and advantages of the invention will emerge from the following detailed description of a preferred embodiment.

**BRIEF DESCRIPTION OF THE DRAWINGS**

This description will be given in reference to the attached figures, in which:

- FIG. 2 is a perspective view of a slider according to the invention, presented in reversed position;
- FIG. 3 is an end view of the slider of FIG. 2;
- FIG. 4 is a bottom view of the slider of FIG. 2;
- FIG. 5 is an end view of the slider of FIG. 2, according to a direction opposite that of FIG. 3;
- FIGS. 6 and 7 are views equivalent to those in FIGS. 4 and 5, the flanks being illustrated in a spread position;
- FIG. 8 is a view equivalent to FIG. 2, the flanks being illustrated in a spread position;
- FIG. 9 is a view similar to FIG. 3, the flanks being illustrated in a spread position;
- FIG. 10 is a view of the slider according to the invention, in perspective;
- FIG. 11 illustrates a sectional view of the slider according to the invention in a sectional plane along line XI-XI illustrated on FIG. 3.
- FIG. 12 illustrates schematically this sectional view of the slider according to the invention in an illustration similar to FIG. 1B.

**DETAILED DESCRIPTION**

The example of slider of the invention overall has a structure known per se, close to that of FIG. 1.

As with this known slider, the slider according to the invention has a cross-section in an inverse "U" shape, with a base to which are attached two lateral and parallel wings (or flanks) 11 and 12.

In FIG. 2, it is presented in a position opposite to the one it occupies when it is in place on a sachet:

The internal space of the slider encloses means adapted for stressing complementary profiled closure shapes or tracks of a sachet (marked respectively P1 and P2) in FIG. 1, by moving towards or moving away according to the direction of displacement of the slider along these profiled shapes or tracks. P1 and P2. The expression "internal space" means the space delimited by the base 10 and the flanks 11 and 12.

In this case, the means comprise a longitudinal central rib 13C which extends according to the longitudinal median plane PM of the slider.

This rib 13C, originating from material with the inner face of the base 10, separates the internal space into two channels or corridors C1 and C2.

As shown more particularly in FIGS. 3 and 5, the rib 13C extends downwards via an elongated central base 14 which overflows on either side of the rib 13C to constitute guide facets of a protuberance T1, T2 (see FIG. 1), here in the form of a point of an arrow, situated above an associated profiled closure shape P1, P2 at the end of the slots S1 and S2 of the bag. Each facet is turned to the base 10. "Protuberance" denotes any means associated with the corresponding profiled shape, which allows the slider to cooperate with the sachet.

This base 14 comprises a first "wide" part 140, in the general form of an iron base (that is, overall triangular when viewed from above), which is prolonged by a narrower part 141.

Also, opposite the two parts 140 and 141 of the base 14, the inner faces of the flanks 11 and 12 each bear a projection 112, 122, respectively 113, 123, which is also provided with a guide facet of a protuberance.

The corridors or channels C1 and C2 are therefore delimited by the base 10, the rib 13C, and its associated base 14, the inner faces of the flanks 11 and 12 and their associated projections 112, 122, 113, and 123. In other terms, the corridors or channels C1 and C2 have the form of throats or grooves with convergent edges.

In the example shown here, along the longitudinal free rim of each flank 11 and 12 extends a stiffening bar 110, respectively 120, of a thickness greater than the remaining part of the flank.

In the example shown here, each bar 110 and 120 has on its free face, opposite the base 10, a keying finger 111, respectively 121.

In an embodiment which is not shown here, the slider could have the general structure described in French application published under No. 2924312, in which load pins are provided in the extension of the flanks 11 and 12.

In the figures, it is evident that the opposite ends of the slider conform to arches 15, of a thickness greater than the rest of its body.

In accordance with the invention, the abovementioned corridors C1 and C2 define channels which are convergent towards an axial end AE1 of the slider and are divergent towards the opposite axial end AE2.

In other words said channels C1 and C2 extend generally according to respective median rectilinear planes Y1-Y1 and Y2-Y2 which are not parallel.

A first axial end C11, C21 of the channels C1 and C2 wherein the channels are convergent makes input end of the channels. This input end of the channels corresponds to the free opening defined between the central rib 13C and the respective projections 113, 123.

A second axial end C12, C22 of the channels C1 and C2 wherein the channels are divergent makes output end of the channels. This output end of the channels corresponds to...
Moreover as indicated above and as illustrated on FIGS. 11 and 12, the slider of the invention is characterized in that, the external edge EC11, EC21 of the input end of the channels C1 and C2 is at a distance I2 of the median central longitudinal plane PM at least equal to the distance I1 separating the internal edge IC12, IC22 of the output end of the channels C1 and C2 from the median central longitudinal plane PM and the wall of the base 10 in regard to the channels C1 and C2 corresponds to the lower thickness of the slider.

As illustrated on FIG. 12, the external edge EC11, EC21 of the input end of the channels C1 and C2 corresponds to the face of the projections 112, 122 directed towards the median plane PM, while the internal edge IC12, IC22 of the output end of the channels C1 and C2 corresponds to the face of the central rib 13C directed towards the projections 112, 122.

As explained above with the above feature, the present invention warrants that the two flanks 11 and 12 are pivoted parallel to parallel axes X-X', which represent preferred fold lines.

Consequently the flanks 11 and 12 remain parallel when opening the slider. Consequently inserting the slider upon the complementary tracks P1 and P2 is easier than with a slider in accordance with the prior art.

Preferentially the external edge EC11, EC21 of the input end of the channels C1 and C2 is at a distance I2 of the median central longitudinal plane PM slightly greater than the distance I1 separating the internal edge IC12, IC22 of the output end of the channels C1 and C2 from the median central longitudinal plane PM and the wall of the base 10 in regard to the channels C1 and C2 corresponds to the lower thickness of the slider.

In practice, these corridors or channels C1 and C2 are bordered laterally by the base of the rib 13C and by the foot of the projections 112, 113, and 123.

In an attempt to deform the slider according to the invention, in order to place profiled shapes or tracks such as those P1 and P2 of FIG. 1, the flanks 11 and 12 are moved apart from one another, for example by exerting a force on their inner face, as shown by arrows f of FIG. 8. This allows the corridors or channels C1 and C2 to be "opened" and enables placing of the profiled shapes or tracks P1 and P2.

Once this operation is done, the force is stopped and the flanks 11 and 12 naturally regain their initial position.

This force is applied most closely to the free end of the flanks 11, 12 to produce the biggest possible lever arm.

Of course, the slider "folds" in the zones where there is least material. These "fold zones" correspond to the regions of the base 10 deprived of material outgrowth.

These zones correspond to the corridors or channels C1 and C2 along axis X-X'.

The letter P in FIG. 7 is used to mark the deformation planes of the base 10 of the slider, along axes X-X'.

With respect to parallel planes, the mechanical stresses to be implemented to produce these deformations are reasonable and the risks of breaking the slider are reduced.

Of course, the slider of the invention can be provided differently to that described here. It can especially be devoid of stiffening bars.

In a variant embodiment, not shown, the above axes X-X' could be marked visually, for example in the form of a line traced on the inner face of the base 10, or even in the form of a groove made therein.

1. A slider for actuating profiled closure shapes or tracks (P1, P2), especially for a closure assembly equipping a sachet or bag, comprising a base (10), two flanks (11, 12) parallel to a median central longitudinal plane (PM), and means (13C, C1, C2) adapted for stressing respectively said profiled closure shapes or tracks (P1, P2), by moving towards or moving away according to the direction of displacement of the slider along profiled shapes or tracks (P1, P2), for moving the profiled shapes (P1, P2) between a closed latch position and an open separated position, and comprising a central longitudinal rib (13C) which subdivides its internal space into two non parallel corridors or channels (C1, C2), characterized in that a first axial end (C11, C21) of the channels (C1, C2) wherein the channels are convergent making input end of the channels while a second axial end (C12, C22) of the channels (C1, C2) wherein the channels are divergent making output end of the channels, the external edge (EC11, EC21) of the input end (C11, C21) of the channels is at a distance (I2) of the median central longitudinal plane (PM) at least equal to the distance (I1) separating the internal edge (IC12, IC22) of the output end (C12, C22) of the channels (C1, C2) from the median central longitudinal plane (PM) and the wall of the base (10) in regard of the channels (C1, C2) corresponds to the lower thickness of the slider.

2. The slider of claim 1, wherein the external edge (EC11, EC21) of the input end (C11, C21) of the channels is at a distance (I2) of the median central longitudinal plane (PM) slightly greater than the distance (I1) separating the internal edge (IC12, IC22) of the output end (C12, C22) of the channels (C1, C2) from the median central longitudinal plane (PM).

3. The slider of claim 1, wherein said longitudinal rib (13C) is extended by a wide part (140) which extends on either side of said longitudinal rib in the two channels (C1, C2) for guiding facets of said profiled closure shapes.

4. The slider as claimed in claim 3, wherein said wide part (140) extends on either side of said longitudinal rib (13C) in a direction to align with projections (112, 122, 113, 123) on the two flanks (11, 12).

5. The slider as claimed in claim 1, wherein along a longitudinal free edge of each flank (11, 12) extends a stiffening bar (110, 120), and wherein a thickness of each stiffening bar (110, 120) is greater than a thickness of its corresponding flank (11, 12).

6. The slider as claimed in claim 5, wherein each stiffening bar (110, 120) has a same longitudinal range as its corresponding flank (11, 12).

7. The slider as claimed in claim 1, wherein said slider comprises projecting load pins on said flanks, in the vicinity of the end of those flanks opposite said base, for opening it provisionally and enabling its engagement on said profiled shapes when stress is exerted on said pins.

8. The slider as claimed in claim 1, wherein the input end of the channels (C1, C2) corresponds to the free opening defined between the central rib (13C) and a first set of respective projections (113, 123) provided on said flanks (11, 12), while the output end of the channels (C1, C2) corresponds to the free opening defined between the central rib (13C) and a second set of respective projections (112, 122) provided on said flanks (11, 12).
9. The slider as claimed in claim 8, wherein the external edge (EC11, EC21) of the input end of the channels (C1 and C2) corresponds to the face of the first set of projections (113, 123) directed towards the median plane (PM), while the internal edge (IC12, IC22) of the output end of the channels (C1 and C2) corresponds to the face of the central rib (13C) directed towards the second set of projections (112, 122).

10. A bag comprising a slider as claimed in claim 1.

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