The zipper with removable slider includes two completely separable tooth rows each having opposite first and second end pins overlapping one another. The slider includes two tooth row passages extending therethrough, with an end pin receptacle overlying the tooth row passages. The tooth row passages accept passage of the two tooth rows therethrough and merge to selectively join or separate the tooth rows to form or separate the zipper chain, depending upon the direction of slider movement. The end pin receptacle accepts the end pins at adjacent ends of the first and second tooth rows, and selectively locks those end pins in place in the slider to secure the slider in position on the zipper assembly and hold the zipper closed. The slider may be completely removed from both tooth rows and the panels to which the tooth rows are attached may be separated, inverted or interchanged as desired.
ZIPPER WITH REMOVABLE SLIDER

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates generally to fasteners, and more particularly to a zipper with a removable slider.

[0003] 2. Description of the Related Art

[0004] The basic concept of the zipper has been known for a considerable time. Such devices initially included a single stop at the ends of the two rows of teeth, with the two fabric panels being permanently secured to one another at least at the bottom end of the zipper assembly where the two rows of teeth were joined by the stop. A later development was the retainer box, wherein one side of the box is formed with an integral end pin while the other side of the box is open to permit the removable installation of the end pin of the opposite tooth row. This permits zippers to be installed upon articles requiring complete opening, e.g., jackets, etc.

[0005] While the zipper having completely separable rows of teeth was a significant advance in the art of zippers, the slider is still generally captured along one of the tooth rows, i.e., the tooth row having the permanently installed retainer box at one end thereof. Since the slider cannot be removed, it always retains the same orientation relative to the surfaces of the panels to which the zipper is attached. Thus, the fabric (or other) panels to which such a zipper is installed cannot be reversed relative to one another, i.e., with one normally outwardly disposed surface being reversed to form one of the inwardly disposed surfaces. This greatly limits the potential versatility of articles incorporating zippers for fastening their panels to one another.

[0006] Thus, a zipper with removable slider solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

[0007] The zipper with removable slider includes completely separable first and second tooth rows that may be assembled into a completed zipper chain to secure two zippered panels to one another. Each tooth row includes a first end pin and an opposite second end pin, with the first and second end pins of each tooth row overlapping another. The zipper tooth rows may comprise rows of individual teeth or may be of the coil configuration, as desired.

[0008] The zipper assembly further incorporates a slider having a pair of tooth row passages extending there-through, with an end pin receptacle overlying the tooth row passage pair. The tooth row passages merge into a single zipper chain passage, with this structure selectively merging the two rows of zipper teeth into a single assembled zipper chain or disassembling the chain to separate the two tooth rows from one another, depending upon the direction of movement of the slider. The end pin receptacle accepts the two end pins at the adjacent ends of the first and second rows of teeth, and selectively lock those two end pins in place in the slider to secure the slider in position on the zipper assembly and hold the zipper closed.

[0009] The zipper is opened by releasing the end pin lock on the end pins captured within the end pin receptacle and sliding the slider along the zipper chain to open the zipper. The slider may be slid from the opposite end pins when that point is reached on the zipper, thus completely separating the slider from the two zipper tooth rows. At this point, either of the two zippered panels may be inverted relative to the other and the slider reinstalled, or a separate zippered panel incorporating one of the zipper tooth rows and end pins of the present invention may be installed to one of the separated panels as desired. The zipper and its removable slider thus provides significantly greater variety in the assembly of zippered articles and panels, e.g., furniture cushions, pillows, etc.

[0010] These and other features of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a perspective view of a zipper with removable slider according to the present invention, showing the slider installed upon a closed zipper.

[0012] FIG. 2 is a detailed exploded perspective view of the slider, showing its components and exemplary zipper end pins that install removably in the slider.

[0013] FIG. 3 is a side elevation view in section of the zipper slider with the zipper removed therefrom.

[0014] FIG. 4 is a side elevation view in section of the zipper slider with the zipper installed therein, similar to the assembly of FIG. 1.

[0015] FIG. 5 is a top plan view in section of the zipper slider with the zipper removed therefrom.

[0016] FIG. 6 is a top plan view in section through the upper portion of the zipper slider with the zipper end pins installed therein.

[0017] Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] The present invention relates to a zipper assembly wherein the slider is removable from the two zipper tooth rows and the zipper chain comprising the two interlocked tooth rows. This allows the slider to be inverted relative to the two zippered panels in order to allow the surfaces of the panels to be inverted or reversed. The slider includes receptacles or passages for simultaneously securing the two opposite ends of each of the two zipper tooth rows of a completed zippered assembly. The zippered panels are completely separable from one another as well, thereby allowing different panels equipped with the present zipper system to be interchangeably assembled with one another as desired.

[0019] FIG. 1 provides an illustration of a zipper with removable slider, comprising a removable slider assembly 10 securing the ends of interlocked first and second zipper tooth rows 12a and 12b to form a closed zipper chain loop. The corresponding tapes 14a and 14b from which the two tooth rows 12a, 12b extend would be attached to the respective peripheries of separable panels or covers for cushions, pillows, or other similar upholstered objects, or perhaps articles such as separate first and second laptop computer cover portions, luggage covers, etc., thereby enabling the covers to be reversed or interchanged to change the appearance or decor of the object. Each of the tooth rows 12a, 12b has a first end terminating in a first end pin, respectively 16a (shown in FIG. 4) and 16b, and an opposite second end terminating in a second end pin, respectively 16a and 18b. These end pins 16a through 18b are specifically configured to work with the slider assembly 10, and are discussed in detail further below.
FIG. 2 provides a more detailed illustration of the slider assembly 10, as well as the end pins 18a and 18b that form the second ends of the two zipper tooth rows. The slider assembly 10 includes a slider body 20 having laterally separated first and second tooth row passages, respectively 22a and 22b, that merge into a single zipper chain passage 24 (FIGS. 3 and 4) at the opposite end portion of the slider body. However, the slider body 20 further includes an end pin receptacle 26 for installing and selectively locking in place a pair of end pins extending from either of the ends of the two zipper tooth rows 12a and 12b. The end pin receptacle 26 is sufficiently wide to accept both end pins 16a, 16b or 18a, 18b of the adjacent ends of the interlocked zipper tooth rows 12a and 12b, and overlies the two tooth row passages 22a and 22b of the slider body 20.

An end pin lock 28 is installed within the end pin receptacle 26 of the slider body 20, and serves to hold the two zipper tooth row end pins 16a, 16b or 18a, 18b within the slider body or conversely to securely the slider body to the zipper tooth row ends defined by the end pins installed within the receptacle 26. The end pin lock 28 comprises a spring formed of flat stock and having laterally opposed first and second leaves 30a, 30b forming a generally V-shaped configuration, with opposite first and second distal ends 32a and 32b respectively extending from the two leaves 30a and 30b. The two laterally extending ends 32a and 32b are captured behind the outboard sides of the end pin receptacle 26 of the slider body 20, and serve to retain the lock spring 28 within the slider body 20.

The lock spring 28 is prevented from passing completely through the end pin receptacle 26 by a stop 34 that extends across the rear center of the receptacle, as shown in the sectional views of FIGS. 3 through 6. Each of the leaves 30a and 30b includes an end pin engagement protrusion, respectively 36a and 36b, extending therefrom. The protrusions 36a, 36b may be in the form of a rounded bump stamped in each of the leaves, or other configuration as desired. The back of the protrusion 36a is shown as a stamped depression in the sectional views of FIGS. 3 and 4.) These protrusions engage corresponding elongate recesses or detents 38 formed in the sides of the end pins 16a through 18b, to hold the inserted end pins securely within the slider body 20 until released. A release button 40 may be provided upon each of the distal ends 32a, 32b of the end pin lock spring 28, if so desired.

FIGS. 3 and 5 respectively provide plan and elevation views in section of the slider body 20, showing the installation of the end pin lock spring 28 therein. It will be seen in FIG. 5 that the resilience of the lock 28 causes the two leaves 30a, 30b to spread, urging each leaf outwardly toward the laterally opposed outer walls of the end pin receptacle 26. This is the condition of the slider body and its end pin lock 28 when no end pins 16a, 16b, 18a, or 18b are installed within the receptacle 26.

FIGS. 4 and 6 respectively provide plan and elevation views in section similar to FIGS. 3 and 5, but showing the configuration of the slider body 20 and its end pin retaining lock 28 with the two zipper rows second end pins 18a and 18b installed within the end pin receptacle 26. The insertion of the two end pins, either 18a or 18b as shown or alternatively the two first end pins 16a and 16b if the orientation of the slider body 20 is reversed, forces the two leaves 30a and 30b together and allows the two pins 18a, 18b to slide along the sides of the leaves and the inner walls of the receptacle 26 until one of the pins, e.g. pin 18a, contacts the corresponding distal end 32a of the lock spring 28. Alternatively, the end pin insertion limit may be defined by the end of either of the zipper tapes 14a or 14b contacting the end of the slider body 20.

In any event, the two lock spring leaves 30a, 30b spring outwardly to the limit defined by the two zipper row end pins 18a, 18b, thereby urging the two protrusions 36a, 36b into the corresponding elongated recesses or detents 38 formed in the sides of the end pins. As the zipper teeth of the tooth rows 12a and 12b are staggered along the length of the zipper due to their alternating interlocking, it will be seen that the two end pins at each end of the zipper chain, e.g., pins 18a, 18b will be correspondingly offset longitudinally.

This is the reason for the elongated recesses or detents 38 formed in the sides of each of the end pins 16a through 18b. By forming the detents 38 as elongated recesses, each of the end pins 16a through 18b may be formed identically to one another while still engaging the protrusions 36a, 36b of the end pin lock spring 28 regardless of the longitudinal offset or stagger of the two end pins 18a, 18b due to the stagger of the interlocking zipper teeth. Also, while the recesses or detents 38 are shown in only one side of the two end pins 18a and 18b in FIG. 6, such recesses 38 may be provided on both sides of each of the end pins 16a through 18b as shown in FIG. 2, to allow all of the end pins to be manufactured identically and interchangeably with one another.

FIGS. 1 and 4 show the zipper slider 20 in its installed state, securing the two opposite ends of the assembled zipper chain by means of the four end pins 16a through 18b. The slider body 20 has been advanced along the rows of zipper teeth 12a and 12b until reaching the first ends of the rows, with the two end pins 16a, 16b defining the first zipper tooth row first ends remaining within the slider body 20. The opposite second end pins 18a, 18b may then be inserted into the end pin receptacle 26 and locked therein by the end pin lock spring 28, as described further above.

Manipulation of the slider assembly 10 is accomplished by means of the pull tab 42 extending from the slider body above the end pin recess 26. The zipper tooth rows 12a, 12b and their tapes 14a, 14b are formed to have sufficient length to extend completely around the periphery of the article to which they are attached, with the first end pin pair 16a, 16b and second end pin pair 18a, 18b overlying and underlying one another to permit simultaneous installation within the slider body 20, as shown in FIGS. 1 and 4. The ends of the tapes 14a, 14b and their end pins 16a through 18b are not secured to the underlying panel, in order to permit either end pin pair to be positioned to overlie or underlie the opposite end pin pair. Thus, the slider body 20 may be oriented in either direction to open or close the zipper from either direction as desired.

Removal of the slider assembly 10 from the two zipper tooth rows 12a, 12b is accomplished by pressing the two end pin lock release buttons 40 together to release the end pin engagement protrusions 36a, 36b from the corresponding end pin recesses 38 and backing the slider body 20 away from the two end pins installed in the end pin receptacle 26 of the slider body, i.e., to the right as shown in FIG. 4. Once the end pin pair installed in the end pin receptacle 26 has been removed therefrom, the slider assembly 10 may be advanced to the left (again, as shown in FIG. 4) to remove the slider assembly from the first end pin pair 16a, 16b. The remaining sliderless zipper has a very flat and low profile without the
slider installed thereon, thereby providing a smooth and essentially unbroken attachment line for the zippered assembly (e.g., a pair of panels or cushion covers surrounding a pillow or cushion, etc.). The sliderless zipper assembly is unobtrusive and very nearly undetectable when the cover or panel to which it is attached is provided with a cover flap or fly along the zipper line.

Disassembly of the zippered components is accomplished by locating the overlying and underlying end pin pairs 16a through 16b, and installing either end pin pair in the zip chain passage 24 of the slider body 20. In the example shown in the drawing Figs., the zip chain passage 24 is to the right side or end of the slider body, with the first end pins 16a, 16b being installed therein to initiate zippering or complete zip closure. However, it will be seen that the orientation of the slider body may be reversed from that shown in the drawings and the second end pin pair 18a, 18b installed in the zip chain passage if so desired, due to the selective underlying and overlying of either end pin pair relative to the other. Once the end pins, e.g., the first end pin pair 16a, 16b, have been installed in the zip chain passage 24, the slider assembly 10 is manipulated to open the zip by sliding it along the zipper, i.e., to the right, as shown in the drawing Figs. The slider assembly 10 is moved completely about the periphery of the zippered object to completely open the zip, and removed from the opposite second end pins as they pass through the zip chain passage 24 and out the first and second tooth row passages 22a and 22b of the slider body 20. The separated zippered panels may then be reoriented with the previously inward facing surface of either or both panels turned to face outwardly, and/or a third zippered panel of appropriate configuration may be assembled with either of the first two panels, as desired.

Various alternatives may be provided in lieu of the structure described above. For example, the function of the lock spring 28 with its protrusions 36a, 36b may be achieved by a central divider with spring loaded ball detents to engage the end pin recesses 38, or perhaps a friction fit of the pins within the receptacle of the zipper body. Another alternative would be to provide a zipper pull tab having an extension that passes through the two zipper rows, with opposed tangs that engage the two zipper rows or pin ends when the pull tab is lowered parallel to the zipper rows, somewhat like the pull tab of a conventional zipper with its single tang that engages the adjacent zipper teeth when the tab is against the zipper to lock the slider in place.

It is to be understood that the present invention is not limited to the embodiment described above, but encompasses any and all embodiments within the scope of the following claims.

We claim:

1. A zipper with removable slider, comprising:
   a slider body defining first and second tooth row passages disposed therethrough, the tooth row passages merging into a single zip chain passage, and an end pin receptacle overlying the first and second tooth row passages; a first tooth row having mutually opposed first and second ends; and a second tooth row having mutually opposed first and second ends, the slider body removable installing upon the first tooth row and second tooth row, selectively securing the first tooth row and second tooth row together to form an assembled zipper chain and selectively separating the first tooth row and second tooth row from one another to disassemble the zipper chain.

2. The zipper with removable slider according to claim 1, further comprising first and second end pins disposed upon the first and second ends of each tooth row, respectively, the respective first and second end pins of each tooth row overlapping one another.

3. The zipper with removable slider according to claim 2, further comprising an end pin lock installed within the end pin receptacle of the slider body.

4. The zipper with removable slider according to claim 3, wherein:
   the end pin lock comprises a spring having a first and a second leaf forming a generally V-shaped configuration, each of the leaves having an end pin engagement protrusion disposed thereon; and each end pin has a detent selectively engaging the corresponding protrusion of the leaf of the end pin lock when the end pins are installed within the end pin receptacle of the slider body.

5. The zipper with removable slider according to claim 4, wherein each of the leaves has a distal end having a release button disposed thereon.

6. The zipper with removable slider according to claim 4, wherein each of the end pin detents comprises an elongated recess, whereby the end pins installed within the end pin detents are longitudinally offset relative to one another.

7. The zipper with removable slider according to claim 1, further comprising a pull tab extending from the slider body.

8. A zipper with removable slider, comprising:
   a first tooth row having mutually opposed first and second ends; a second tooth row having mutually opposed first and second ends, the respective first and second end pins of each tooth row overlapping one another; and a slider body having first and second tooth row passages disposed therethrough and an end pin receptacle formed therein, the slider being removable installed upon the first tooth row and second tooth row and selectively joining and separating the first slider and second slider to form lo and open a zipper chain.

9. The zipper with removable slider according to claim 8, wherein the first and second tooth row passages of the slider body merge into a single zip chain passage, the end pin receptacle overlying the first and second tooth row passages.

10. The zipper with removable slider according to claim 8, further comprising an end pin lock installed within the end pin receptacle of the slider body.

11. The zipper with removable slider according to claim 10, wherein:
   the end pin lock comprises a spring having a first and a second leaf forming a generally V-shaped configuration; each of the leaves has an end pin engagement protrusion disposed thereon; and each end pin has a detent selectively engaging the corresponding protrusion of the leaf of the end pin lock when the end pins are installed within the end pin receptacle of the slider body.

12. The zipper with removable slider according to claim 11, wherein each of the leaves has a distal end having a release button disposed thereon.

13. The zipper with removable slider according to claim 11, wherein each of the end pin detents comprises an elon-
gated recess, whereby the end pins installed within the end pin detents are longitudinally offset relative to one another.

14. The zipper with removable slider according to claim 8, further comprising a pull tab extending from the slider body.

15. A zipper with removable slider, comprising:
   a slider body defining first and second tooth row passages disposed therethrough, the tooth row passages merging into a single zipper chain passage, and an end pin receptacle overlying the first and second tooth row passages;
   an end pin lock installed within the end pin receptacle;
   a first tooth row having mutually opposed first and second end pins; and
   a second tooth row having mutually opposed first and second end pins, the respective first and second end pins of each tooth row overlapping one another, the slider body removably connecting the first tooth row and second tooth row, the first end pins of the first tooth row and second tooth row being disposed within the tooth row passages of the slider body, the second end pins of the first tooth row and second tooth row being disposed within the end pin receptacle of the slider body and selectively locked therein to secure the zipper in a closed chain configuration.

16. The zipper with removable slider according to claim 15, wherein:
   the end pin lock comprises a spring having a first and a second leaf forming a generally V-shaped configuration;
   each of the leaves has an end pin engagement protrusion disposed thereon; and
   each of the end pins has a detent selectively engaging the corresponding protrusion of the leaf of the end pin lock when the end pins are installed within the end pin receptacle of the slider body.

17. The zipper with removable slider according to claim 16, wherein each of the leaves has a distal end having a release button disposed thereon.

18. The zipper with removable slider according to claim 16, wherein each of the end pin detents comprises an elongated recess, whereby the end pins installed within the end pin detents are longitudinally offset relative to one another.

19. The zipper with removable slider according to claim 15, further comprising a pull tab extending from the slider body.

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