This invention relates to a reclosable, reusable container having a novel closure element and, in particular, to a reclosable container utilizing flexible interlocking rib and groove elements as a closure means.

Flexible closure fasteners have characteristically been formed of elongated interlocking elements heat sealed to a pouch or container opening for providing a readily reclosable system.

Recently emphasis in the flexible closure field has been directed toward forming a closure strip integrally with the pouch or container film. This objective derives from the fact that flexible closure strips and their associated containers have been constructed of plastic-like materials. Also, emphasis in the flexible closure field has recently been directed to acquiring a tight seal for the associated pouch or container. This is also a desirable objective as interlocking rib and groove elements are especially suited to tight closures.

In contrast, this invention utilizes a thermoplastic closure strip with a pouch or container constituted in certain instances of a dissimilar material and for a function that requires a spot type holding action rather than an edge-wise air tight seal. In particular, an application of this invention is found in office type envelopes and the like.

Large office type envelopes and other paper or corrugated containers have commonly used such devices as snaps, washers and string devices, and bifurcated tabs for closing the opening thereof. Such devices, however, have had the disadvantage of being susceptible to failure after repeated use and to tearing or otherwise mutilating the associated container.

In addition, envelopes using such devices are not entirely susceptible to being stacked or otherwise handled in large quantities as the associated washers, tabs, and string tend to become snagged and entangled. Accordingly, it is a principal object of this invention to provide a thermoplastic flexible rib and groove element for closing a dissimilarly constructed container or envelope.

It is also an object of this invention to provide a novel container or envelope having a flexible closure button as a fastening feature.

It is another object of this invention to provide a novel container or envelope utilizing a flexible closure button having a plurality of rib and groove elements disposed substantially perpendicular to the container or envelope opening.

It is another object of this invention to provide a novel plastic container or envelope having a multiple track flexible closure button, which button can be sealed in place, thereby avoiding the tearing action created by a metal snap button when affixed to plastic.

It is a further object of this invention to provide a novel container or envelope utilizing a flexible closure button having a plurality of rib and groove elements and thereby providing an adjustable alignment means for accommodating changing container loads and for eliminating the need for precision alignment heretofore required of flexible closure elements.

These and other objects, features and advantages of the present invention will be understood in greater detail from the following description and the associated drawings wherein reference numerals are utilized in designating a preferred embodiment and wherein:

FIGURE 1 is an elevated view of a standard sized interoffice type envelope having a closure flap in an opened position for illustrating the novel closure features of this invention;

FIGURE 2 is an elevated view of an interoffice type envelope similar to that shown in FIGURE 1 having a closure flap in a sealed position and illustrating an alternate arrangement of the novel closure elements of this invention;

FIGURE 3 is also an elevated view showing a similar type interoffice envelope and illustrating another alternate arrangement for the novel closure fixture of this invention;

FIGURE 4 is an elevated view of a rigid type container having a closure flap illustrating the novel closure features of this invention;

FIGURE 5 is an enlarged cross-sectional view of a closure element as used in the containers or envelopes of this invention and illustrating the configuration of the interlocking rib and groove elements;

FIGURE 6 is also an enlarged cross-sectional view of a closure fixture as utilized in the embodiments of this invention and illustrating an alternate configuration of the interlocking rib and groove elements;

FIGURE 7 is a further cross-sectional view of a closure fixture as found in an embodiment of this invention and illustrating a novel rib and groove configuration particularly adapted to the locking function indicated by this invention;

FIGURE 8 is also a cross-sectional view of a closure fixture as found in an embodiment of this invention and illustrating a further novel rib and groove structure especially suited for the closure function attributable to this invention; and

FIGURE 9 shows a rib element and a diagrammatic representation of a groove surface for providing a simplified illustration of the cooperable functioning of the associated rib and groove elements as displayed in FIGURE 8.

Exemplary embodiments of this invention are shown in FIGURES 1 through 4 and comprise generally an envelope or container constructed of a paper or paper-like material and having a closure flap for supporting a flexible closure button constructed of a thermoplastic substance. Though the envelope referred to was made of paper-like material, the flexible closure button can just as well be applied to a vinyl type case or envelope, in which case the button would be sealed to the envelope material.

The flexible closure button consists of first and second button members which are securely mounted to the body of the envelope or container and to the inner facing of the closure flap. These buttons may be disposed such that the interlocking rib and groove elements are oriented to be either perpendicular or parallel to the envelope or container opening. When mounted in a parallel orientation the rib elements are peeled from their locked position within an opposing groove element, while for a perpendicular orientation the rib elements are forcibly withdrawn longitudinally of the cooperable grooves.

Referring to FIGURES 1 through 4 in greater detail, a standard sized paper envelope 10 has front and rear facings 11 and 12, respectively, and a closure flap 13 formed integrally with the front facing 11 and folded as at 14 to overlie the rear facing 12.

The closure flap 13 has tapered side walls 15 and 16 and a truncated edge 17 for cooperating with a recession of the back wall 12. Similarly, the back wall 12 has tapered edges 18 and 19 and a truncated edge 20 which together with the closure flap 13 define the envelope opening 21. The tapered edges 18 and 19 and the described configuration of the closure flap 13 cooperate to permit easy access to the envelope interior as is well understood.

However, to inhibit undesirable egress from the envelope the closure flap 13 must be maintained in a
folded position against the rear facing 12. To accomplish this holding action a flexible closure button is provided between the adjacent faces of the closure flap 13 and the rear facing 12.

The flexible closure button as utilized in FIGURE 1 comprises a first button member 22 fixedly secured to the inner face 23 of the closure flap 13. The button member 22 comprises a rib and groove elements 24 and 25 which are oriented perpendicular to the fold 14 or substantially perpendicular to the opening of the envelope.

A second button member 26 cooperates with the first button member 22 to complete the flexible closure button of the envelope and is mounted securely to the rear facing 12 substantially centrally of the truncated edge 20. The button member 26 is also provided with rib and groove elements 27 and 28, respectively, which are formed to be complementary to the corresponding elements 24 and 25 of the button member 22. The button member 26 is oriented at the upper portion of the rear facing 12 for being joined by the button member 22 upon folding of the closure flap 13 about the pivotal mounting 14.

Both button members 22 and 26 are provided with a plurality of rib and groove elements. Furthermore, the rib and groove elements are provided with a substantial length. Both these factors cooperate to eliminate the need for precise alignment of the closure flap 13 about the rear facing 12 of the envelope 10. In particular, any one of the rib elements fitted within a complementary groove of an opposing button member would provide the necessary locking function between the flap 13 and the rear facing 12. Therefore, substantial twisting of the closure flap 13 due to irregularity of the crease or fold 14 or due to the unequal distribution of contents within the envelope 10 can be tolerated despite misaligning of one rib element with an opposing complementary groove element.

In addition, as the contents of the envelope increase, the reach of the closure flap 13 about the rear facing 13 will be substantially reduced. This is because the crease 14, sharply defined when the envelope is empty, becomes an enlarged rounded fold when the envelope is heavily laden. However, due to the elongated character of the rib and groove elements on the respective closure buttons, the substantially reduced reach of the closure flap 13 can be accommodated because only a small portion of the closure flap 13 is required to engage the button member 26 to produce the necessary holding action.

In FIGURE 2 the envelope 10 is shown to be provided with an alternate arrangement for holding the closure flap 13 substantially contiguous with the rear facing 12. In particular, the closure flap 13 and the rear facing 12 are equipped with dual flexible closure buttons 30 and 31 disposed symmetrically about the inner face 23 of the flap 13. Such an arrangement may be provided where added closure strength is required or where more uniform sealing of the edges 15 and 16 and 18 and 19 are desirable.

FIGURE 3 illustrates a further embodiment of this invention wherein the envelope 10 and the cooperating closure flap 13 is provided with a flexible closure button 32 which is disposed substantially parallel to the envelope opening. The flexible closure button 32, like the button members 22 and 26 of FIG. 1, is provided with a substantially parallel or substantially perpendicular arrangement. In particular, opening the closure flap 13 of FIGURE 3 causes each rib element to be peeled from its complementary groove element rather than to be withdrawn longitudinally thereof. This peeling is done by lifting a flange 53a integrally fastened to the outside rib of the upper button. This configuration is especially useful where heavy duty locking features are desirable.

FIGURE 4 illustrates a further embodiment of this invention and comprises generally a substantially rigid container formed of heavy duty paper, cardboard, or corrugated type materials, or plastic, or plastic coated materials. The container 36 is provided with front and back wall portions 37 and 38 and a rigid cover 39 hinged as at 40 for overlying an opening 41 of the container 36. The cover 39 is provided with a closure flap 42 hinged to the cover at a point 43 in a standard and well-understood manner. The inner surface 44 of the flap 42 is provided with a flexible closure button member 45 having rib and groove elements 46 and 47 oriented parallel to the hinge 43 or parallel to the plane of the opening 41. Similarly, the back wall 38 is provided with a flexible closure button member 48 having similarly oriented rib and groove elements 49 and 50. As in the case of the envelopes of FIGURES 1 through 3, the flexible closure buttons 45 and 48 are provided with a plurality of rib and groove elements which have a substantial length. Therefore, the closure flap 42 may be sealed against the back wall 38 without the need for careful alignment of the rib and groove elements. In this way, the container 36 can accommodate increased loads while providing a tight closure thereabout.

FIGURE 5 shows the configuration of rib and groove elements as may be employed in the embodiments of FIGURES 1 through 4 and comprises essentially thermoplastic base structures 51 and 52 having rib and groove elements 53 and 54 formed integrally therewith. The base structures 51 and 52 are secured to the inner surface of the closure flap 13 of the envelope 10, and to the back wall 12, by a suitable cement layer 55. If the envelope is made of a similar plastic or coated with a similar plastic to that from which the closure is made then the closure can be sealed in place.

In FIGURE 5 the rib elements 53 comprise a rounded head portion 56 and an overhanging ridge 57 having an undercut engaging surface 58 cooperating with a like engaging surface of an opposing rib element for performing the locking function between the wall 12 and the closure flap 13. This cross-sectional configuration, because of the location of the flanges, is particularly adaptable to being unlocked by a peeling motion and is especially suited to the button orientations as indicated in FIGURES 3 and 4. Nevertheless, the embodiment of FIGURE 5 may be employed in other orientations as well.

FIGURE 6 shows an alternate configuration of the rib and groove element structures as utilized in the embodiments of FIGURES 1 through 4. In particular, the rib elements 60 have a rounded head portion 61 and oppositely disposed undercut engaging surfaces 62 and 63. It is apparent, therefore, that the structure shown in FIGURE 6 provided an additional locking function due to the added engaging surface of the rib and complementary groove elements.

FIGURE 7 illustrates a novel cross-sectional rib and groove configuration which is particularly suited to the function characterized by the embodiments of FIGURES 1 through 4. In FIGURE 7 the rib and complementary groove elements 64 and 65 are formed of a continuous single sheet of thermoplastic material 66 formed as integral and secured to a base strip or sheet 67 at a plurality of junctions 68. The result is a substantially sinuous configuration which is readily collapsible and which provides a suitable locking function for most purposes involving the use of interoffice envelopes and similar containers.

The structure as shown in FIGURE 7 is particularly suited to the perpendicular orientation of the flexible closure button indicated in FIGURES 1 and 2 as a continuous surface is provided from the rib to the groove elements allowing the interlocking ribs to be smoothly with-
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drawn longitudinally of the closure button as is required by the opening motion of the envelope 10 in FIGURES 1 and 2. Also, the simplicity of the configuration of FIGURE 7 provides for inexpensive construction and is, therefore, particularly suitable to reducing both the cost and the inefficiency of interoffice envelopes or containers.

FIGURE 8 shows an alternate and novel configuration applicable to the embodiments of FIGURES 1 through 4 and which is characterized by a rib element 72 having plane faces 71 and 72 forming an angular head portion. As is characteristic in flexible closure elements, the groove elements are complementarily formed and are provided with plane surfaces 73 and 74 to form an angled groove portion. Connected to the faces 71 and 72 is a further plane surface 75 which provides a restricted opening 76 leading to an enlarged groove cavity 77. In this respect, the structure of FIGURE 8 is similar to that indicated in FIGURE 6, however, unlike FIGURE 6 the connecting plane face 75 is not undercut as the plane face 63 of FIGURE 6. In this context “not undercut” means that a surface extends progressively and continuously from the head portion of a rib element to a base portion of an adjacent groove element. The surfaces 72, 75 and 73 provide such a progressive extension, while the comparable surface of FIGURE 6 experience a reversal in direction in the vicinity of the undercut face 63.

The configuration illustrated in FIGURE 8 is characterized by both a suitable locking function as a consequence of the restricted opening 76 and the enlarged inner cavity 77 and by an ease of opening which is especially required when employed in conjunction with paper envelopes and the like.

It will be understood that various modifications may be suggested by the embodiment disclosed, but I desire to claim within the scope of the patent warranted hereon all such modifications as come within the scope of my invention.

I claim as my invention:

1. The combination of flexible attachment sheets adapted to be releasably secured to each other for repeated reattachment comprising:
   - first and second flexible sheet members having a flexible closure button disposed for maintaining said first sheet member in overlying relation with said second sheet member,
   - said flexible closure button having a first button member secured to the inner face of said first sheet member and having a second button member fixedly secured at the outer surface of said second sheet member,
   - said first and second button members being constructed of a resilient thermoplastic substance and having an interlocking rib and groove element formed thereon, said rib and groove element of said first button member being complementarily and releasably received by said rib and groove element of said second button member,

   whereby said flexible sheets may be readily opened and closed by said flexible closure button.

2. A reclosable envelope comprising:
   - a container pouch constructed of a paper-like substance having front and back wall portions, a pouch opening and a closure flap formed integrally therewith, said closure flap being pivotally supported at said front wall portion and extending therefrom over said pouch opening for having the inner surface thereof overlying said back wall portion, a flexible closure button disposed for maintaining said closure flap in overlying relation with said back wall portion,
   - said flexible closure button having a first button member secured to the inner face of said closure flap and having a second button member secured at the outer surface of said back wall portion,
said flexible closure button having a first button member secured to the inner face of said closure flap and having a second button member fixedly secured at the outer surface of said second wall portion, said first and second button members being constructed of a resilient thermoplastic substance and having an interlocking rib and groove element formed thereon, said rib element having first and second plane faces forming an angular head portion therein, each of said first and second plane faces having an adjoining plane face extending progressively from said head portion to an adjacent groove element, said rib and groove element of said first button member being complementarily and releasably received by said rib and groove element of said second button member.

6. A reclosable envelope comprising:

a container pouch constructed of a paper-like substance having front and back wall portions, a pouch opening, and a closure flap formed integrally therewith, said closure flap being pivotally supported at said front wall portion and extending therefrom over said pouch opening for having the inner surface thereof overlying said back wall portion, a flexible closure button disposed for maintaining said closure flap in overlying relation with said back wall portion,

said flexible closure button having a first button member secured to the inner face of said closure flap and having a second button member secured at the outer surface of said back wall portion, said first and second button members being constructed of a resilient thermoplastic substance and having an interlocking rib and groove element formed thereon, said rib element having first and second plane faces forming an angular head portion thereon, each of said first and second plane faces having an adjoining plane face extending progressively from said head portion to an adjacent groove element, said rib and groove element of said first button member being complementarily and releasably received by said rib and groove element of said second button member.

7. The combination of flexible attachment sheets as described in claim 1 wherein said flexible closure buttons have a large number of sequentially mating releasably interlocking rib and groove elements with the elements of the first sheet being substantially parallel to the elements of the second sheet, and wherein said flexible attachment sheets are longitudinally adjustable relative to one another to cause the flexible attachment sheets to be drawn tautly relative to an attached member.

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