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ONE-TIME USE PLASTIC LOCK

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This invention relates generally to lock seals and more particularly to new useful improvements in a hand-closable lock seal.

In the handling of mail, money and other valuables, bags are generally used for transporting such articles and it is desirable to have some means for sealing the mouth of the bag or for sealing the hasps of railroad car doors or the like which is effective in operation, simple in construction and inexpensive, requiring minimum effort and no special tools or equipment in applying and removing, and the removal of which will not cause injury to the bag or to the person.

It is accordingly a principal object of the present invention to provide a one-piece lock seal for a bag or pouch, hasp on a railroad car, and like devices, that is highly effective in preventing access to the contents of the bag or other enclosure until the seal has been removed, and in preventing tampering and manipulation of the seal without detection.

Another object of the invention is to provide a lock seal of simple and inexpensive construction so that the seal may be economically discarded after a single use.

A further object of the invention is to provide a lock seal of this kind that can be readily applied to and removed from the article without causing injury to the person or to the bag or other article.

It is also an object of the invention to provide a lock seal having a flexible bag and the like by which the sealing of the bag is facilitated on account of the mechanical advantage provided by the particular structure of the seal, and without danger of any part of the bag being caught in the locking and sealing mechanism thus impairing the efficiency and value of the lock seal and causing injury to the bag itself.

A still further object of the invention is to provide a lock seal of this type having a band which readily can be broken by a mere gripping of a portion of the same between the forefinger and thumb and twisting or applying pressure sufficient to produce separation without the use of tools or implements of any kind, as well as to provide a device which is foolproof and can easily be produced of readily available materials.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a front perspective view of a lock seal embodying my invention shown in extended condition.

FIG. 2 is a front view thereof, parts being omitted and parts being broken away.

FIG. 3 is a cross-sectional view taken on the line 3--3 of FIG. 1.

FIG. 4 is a cross-sectional view taken on the line 4--4 of FIG. 2, on a reduced scale, with the rear wall in position.

FIG. 5 is a longitudinal sectional view taken on the line 5--5 of FIG. 2, with the rear wall in position.

FIG. 6 is a longitudinal sectional view taken on the line 6--6 of FIG. 2.

FIG. 7 is a top perspective view of the lock seal showing the seal folded into operative sealing condition, parts being omitted.

FIG. 8 is a fragmentary perspective view of the lock seal after it has been broken and is ineffective.

Referring in detail to the drawings, in FIG. 1 a lock seal embodying my invention is shown in the extended inoperative condition and is designated by the numeral 10.

The lock seal is shown formed of a single piece of flexible plastic material but it will be understood that the lock seal may be made of paper or other suitable synthetic material.

Structurally the lock seal comprises a socket structure 12 having a rectangular shallow box-shaped body with a base wall 16, integral side walls 18 and 20, and outer and inner end walls 22 and 24, respectively, and plugged with a fixed top wall 25 secured by adhesive or the like.

The inner end wall 24 is cut away providing a rectangular-shaped opening 26 therein. The inner wall is formed with an overhanging ledge 28 and extending from this ledge midway its ends there is an elongated flexible integral narrow band 30.

At both ends of the opening 26 in the inner wall 24, upwardly lugs or hooks 32 are formed on the base 16 at the adjacent corners. The top surface of the base 16 is formed with grooves 36, one end of the grooves terminating at the hooks and extending therefrom to the other end of the body and toward the center of the body in a diagonal or slanting direction. Along the inner surfaces of the side walls 18 and 20, the body is formed with inwardly extending abutments 38 having slanting face portions 40 extending along the slanting edge walls of the grooves 36 and terminating at the inner side surface of the side walls, adjacent the hooks 32.

A latching or locking plug structure 42 is carried on the free end of the band 30. The locking plug structure includes a substantially rectangular-shaped flat body 44 having straight sides with tapering portions 46 at one end, said one end sealing on a pedestal or seat 48 formed on one surface of a flat transverse plate 50 disposed at a plane perpendicularly to the plane of the body 44. The band 30 is fastened at one end to the opposite surface of the plate 50. The end of the band connected to the plate 50 is reduced in width thereby forming a narrow neck portion 52 which is secured as indicated at 53 so that the neck portion 52 is readily fractured and broken off of the plate. The band is formed with an enlargement 54 projecting from one long edge thereof adjacent the neck portion 52. This projecting enlargement has one end formed with a slanting edge thereby providing a V-shaped space 56 between the enlargement 54 and plate 50. The enlargement constitutes a tab and may be gripped and twisted to cause rupture or breakage of the band 30 at the neck portion 52.

At its other end, the body 44 is enlarged forming a head 58 and extending inwardly from the side ends of the head 58 are three flexible arms 60 which are closely spaced from the slanting edges 46 of the sides of the body. The arms also are bent slightly out of the plane of the body 44 so that said arms are offset from the body at their free ends 62 as will be seen in FIG. 6.

In using the lock seal 10, the band 30 is encircled around the gathered material of the mouth of the bag or pouch and the like or through the hasp on the railroad car, and the plug structure 42 is inserted through the throat opening 26 in the socket structure 12. Upon insertion, when the arms are moved inwardly past the side edge walls of the opening 26, the arms are squeezed laterally inwardly toward the sides of the body 44 and are pressed upwardly into the plane of the body 44 thereby reducing the overall width and thickness of the body and permitting the body and arms to pass through the restricted opening into the interior of the socket body where the arms expand to normal condition and engage in the grooves 36 in the base 16 of the body with the free end.
edges 62 of the arms interlocked with the hooks 32 so that outward pulling pressure exerted on the band 30 will only cause the arms to jamb against the hooks thus effectively sealing the bag or pouch. This action is to be depended upon because of the oblique position of the arms. The throat opening 26 is so dimensioned and constructed that no space is left for the insertion of a blade or other tool and even if inserted it could not control the engaging elements.

In this position of the lock seal and its parts, the parts of the seal cannot be separated or disengaged without breaking the band 30. In order to provide for the release or opening of the mouth of the bag or pouch and have the like, the forefinger of the operator may be inserted inside the loop formed by the band 30 and a pull and a twist exerted upon the band whereupon the neck portion 52 will become ruptured or broken thereby separating the band from the socket structure.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A lock seal comprising an elongated narrow band of flexible plastic material having a socket structure at one end and a plug structure at the other end, said socket structure constituted by a rectangular box-like body having side walls, an outer end wall, an inner end wall and a base wall, said inner end wall being connected to the band and having a restricted socket opening facing the band, said band adapted to be bent for insertion of the plug structure into the socket opening, said plug structure including a head portion with flexible side arms, said arms normally projecting laterally of the ends of the opening to prevent entrance through said opening, said arms adapted to be pressed inwardly to reduce the overall width of the head and arms as a unit whereby the head and arms are adapted to pass through the opening when the arms are in such pressed condition, means on the band to facilitate rupture of the band by manual twisting pressure thereagainst, and means on the base wall of the socket structure for interlocking with the arms upon release of the pressure thereagainst and expansion thereof inside the box-like body, including upstanding lugs on the base wall at the ends of the socket opening in the inner wall, and horizontal lugs on the inner surfaces of the side walls with slanting portions leading to the upstanding lugs, said base wall having spaced elongated grooves in the top surface thereof extending diagonally from a point adjacent the axial center thereof to the side walls adjacent the upstanding lugs, said arms adapted to expand radially against the slanting portions of the horizontal lugs and downwardly into the grooves and into interlocking engagement with the upstanding lugs.

2. A lock seal comprising an elongated narrow band of flexible plastic material having a socket structure at one end and a plug structure at the other end, said socket structure constituted by a rectangular box-like body having side walls, an outer end wall, an inner end wall and a base wall, said inner end wall being connected to the band and having a restrictive socket opening facing the band, said band adapted to be bent for insertion of the plug structure into the socket opening, said plug structure including a head with flexible side arms, normally projecting laterally of the ends of the opening to prevent entrance through said opening, said arms adapted to be pressed inwardly to reduce the overall width of the head and arms as a unit whereby the head and arms are adapted to pass through the opening when the arms are in such pressed condition, said band having a weakened transverse portion adjacent the plug structure and having a tab projecting from one long edge thereof adjacent the plug structure for gripping and exerting a twisting pressure against the band in order to break off the band at the weakened portion, and means on the base wall of the socket structure for interlocking with the arms upon release of the pressure thereagainst and expansion thereof inside the box-like body, said interlocking means including upstanding lugs in the path of expansion of said arms.

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