159159
G00001

Description

1. Field of Invention

The present invention relates to the hot-roll forming process of security seal lock and in particular, but not exclusively, to a tamper evident security seal locking system.

Background to the Invention

The subject invention relates to the hot-roll forming process of security seal lock like CS-Grip & CS-Pull ensuring tamper evident to the cargo and pharmaceutical transportation, retail, money handling and utility industries.

This invented hot-roll forming process plays a critical role for security seals in system filing, intrusion with the barcode running number for security.

This hot-roll forming process delivers high quality locking system for security seals, an adjustable plastic strap seal for use on a wide range of applications.

This hot-roll forming product assists shippers, retailers, banks and logistics providers with tamper evident locking through this invented forming process which enhanced protection of their cargo and equipment against theft and terrorism around the world.

As security and asset tracking initiatives continue to be implemented across the globe, this subject lock product through the invented hot-roll forming process is considered a cost effective security and visibility solution within the logistics process.

2. Description of Related Art

In connection with security, it appears to have a growing desire to provide some form effective tamper evident in security.

2.1 The subject hot-roll forming process actually formed security seal lock, non-limiting, for products like CS-Grip, in which inside comprises of the locking metal 'F' and secure grip cover 'G' that is integral with the strap position and holds the product that includes smooth tail insertion for easy pull-up.

2.2 The hot-roll process operates with an invented hot-roll forming die fabricated with a flexibility heater 'D' and thermal coupler 'C'.

2.3 The hot-roll forming die 'A' can be customized and fabricated according to the designated shape of the security lock.

2.4 The hot-roll forming die is fitted into the assembly machine, which equipped with 2 vibrator hoppers containing the locking metal 'F' & secure grip cover 'G' respective.

2.5 The machine is equipped with a conveyor belt that carries the sheet (non-limiting the pieces of straps per sheet) of CS-Grip flowing through at first station, inserting the locking metal 'F'; then at second station, inserting the secure grip cover 'G' into the lock-housing upstanding wall 'E'.

2.6 After filling the CS-Grip lock housing with the locking metal 'F' and secure grip cover 'G'; the sheet of CS-Grip will then flow to third station, which is the hot-roll forming process.

2.7 The sheet of CS-Grip with the lock housing upstanding wall 'E' facing upright will be aligned and placed underneath the hot-roll forming die 'A' with the corporate flexibility heater 'D' and insulating board 'B' assembled on top of forming die 'A' (Figure 5)

2.8 The hot-roll forming die machine is equipped with a heater temperature controller that transmitted the setting temperature to the flexibility heater 'D' through the thermal coupler 'C'.

2.9 The hot-roll forming die will then lower and pressed on the lock-housing upstanding wall 'E' to form the enclosure of the security seal lock of the CS-Grip.

2.10 The subject hot-roll forming process actually formed security seal lock, non-limiting, for products like CS-Pull, in which inside comprises of the universal clip 'L' that is integral with the strap position and holds the product that includes smooth tail insertion for easy pull-up.

2.11 The hot-roll process operates with an invented hot-roll forming die fabricated with a flexibility heater 'D' and thermal coupler 'C'.

2.12 The hot-roll forming die 'A' can be customized and fabricated according to the designated shape of the security lock.

2.13 The hot-roll forming die is fitted into the assembly machine, which equipped with vibrator hopper containing the universal clip 'L'.

2.14 The machine is equipped with a conveyor belt that carries the sheet (non-limiting the pieces of straps per sheet) of CS-Pull flowing through at first station, inserting the universal clip 'L' into the lock-housing upstanding wall 'K'.

2.15 After filling the CS-Pull lock housing with the universal clip 'L'; the sheet of CS-Pull will then flow to forming station, which is the hot-roll forming process.

2.16 The sheet of CS-Pull with the lock housing upstanding wall 'K' facing upright will be aligned and placed underneath the hot-roll forming die 'A' with the corporate flexibility heater 'D' and insulating board 'B' assembled on top of forming die 'A' (Figure 5)

2.17 The hot-roll forming die machine is equipped with a heater temperature controller that transmitted the setting temperature to the flexibility heater 'D' through the thermal coupler 'C'.

2.18 The hot-roll forming die will then lower and pressed on the lock-housing upstanding wall 'K' to form the enclosure of the security seal lock of the CS-Pull.

3. Summary of Invention

It is a forming process with a fabricated forming die fixture that:

- the forming die 'A', fabricated with shape of the designated lock, formed enclosure of the security seal locks (Figure 8 '1'); which comprises lock housing upstanding wall 'E' in which a locking metal 'F' is first fit into and then held down by a secure grip cover 'G'.

- the forming die 'A' would hot-roll process the upper portion of the lock-housing upstanding wall 'E', which the wall plastic is overlaps and compressed on the planar portion of the secure grip cover 'G'.

- a thermal coupler 'C' with flexibility heater 'D' is equipped within the forming die 'A' and 'B', which operates the hot-roll process against the lock housing upstanding wall 'E' to overlap and secures the locking metal 'F' and the secure grip cover 'G', which would additionally prevents tampering of the metal jaw.

- the forming die 'A', fabricated with shape of the designated lock, formed enclosure of the security seal locks (Figure 10 '2'); which comprises lock housing upstanding wall 'K' in which a universal clip 'L' is fit into and housing.

- the forming die 'A' would hot-roll process the upper portion of the lock-housing upstanding wall 'K', which the wall plastic is overlaps and compressed onto the planar portion of the universal clip 'L'.

- a thermal coupler 'C' with flexibility heater 'D' is equipped within the forming die 'A' and 'B', which operates the hot-roll process against the lock housing upstanding wall 'K' to overlap and secures the universal clip 'L', which would additionally prevents tampering of the metal jaw.

4. Brief Drawing Description

Figure 1, an orthographic view of S-Grip forming die invention,

Figure 2 & 3, an exploded view of the forming jig invention,

Figure 4 & 5, a perspective view of the forming jig invention,

Figure 6, a completed view of after hot-roll process CS-Grip,

Figure 7, an exploded view of CS-Grip

Figure 8, a perspective view of CS-Grip

Figure 9, an exploded view of CS-Pull

Figure 10, a perspective view of CS-Pull

5. Detail Descriptions Reference to Drawing

The Figure 1 shows:

- The front view and side view of hot-roll process forming die fixture.

The Figure 2 shows:

- 'A' bottom view of hot-roll process forming die fixture.

The Figure 3A shows:

- 'B' insulating board of heater unit.

The Figure 3B shows:

- 'C' fabricated thermal coupler unit.
- 'D' flexibility heater

The Figure 4 shows:

- the complete view of hot-roll process forming die 'A' and 'B'.

The Figure 5 shows:

- the hot-roll forming die, which hot-roll the upstanding wall forming the CS-Grip lock.

The Figure 6 shows:

- the finished view of the CS-Grip security seal after hot-roll process.

6. Conclusion

This new hot-roll forming process invention formed a tampered evident lock for security seal, which allows shippers, carriers, retailers, banks, and logistics providers to protect their cargo.

The invented hot-roll forming process delivers security lock for additional security due to its high strength and self locking properties.

The hot-roll forming die is designed with non-limiting fabricated lock shape and size with flexibility heater and thermal coupler capable of forming the upstanding wall 'E' and 'K' to roll and overlaps and securely suppressed the planar portion of the secure grip cover 'G' and universal clip 'L'.

The hot-roll formed locks are for easy to pull up, but it is highly impossible to reversal pull out because the integral metal clips inside the product.

Tamper-indicating polypropylene material will blush if tampering occurs and cannot be reattached if broken. Non-limiting, the hot-roll proceeded CS-Grip and CS-Pull can have custom wording and consecutive numbering to enforce accountability, for tracking application.

Claims

The claimed is:

1) The hot-roll process invention consists of 5 different parts,

- 'A' the hot-roll forming die (non-limiting to shape & size of lock).
- 'B' the insulating board of heater unit.
- 'C' the thermal coupler.
- 'D' the flexibility heater.

2) The hot-roll forming die can be customized and fabricated with the designated and intended shapes and sizes.

3) The hot-roll forming process is functioned through heat applied melting the plastic wall to form the designated shape of the fabricated forming die.

4) The hot-roll forming process (non-limiting) heated and melted the CS-Grip lock housing upstanding wall plastic to overlaps forming the lock shape and compressed the planar portion of secure grip cover 'G'.

5) The hot-roll forming process (non-limiting) heated and melted the CS-Pull lock housing upstanding wall plastic to overlaps forming the lock shape and compressed the planar portion of universal clip 'L'.

6) The hot-rolled forming process is invented in a way that the lock housing upstanding wall is melted and formed rigidly in housing the locking metal 'F' and secure grip cover 'G' to be tampered evident and locking the CS-Grip thin strip which is to be inserted into the locking area.

7) The hot-rolled forming process is invented in a way that the lock housing upstanding wall is melted and formed rigidly in housing the universal clip 'L' to be tampered evident and locking the CS-Pull thin strip which is to be inserted into the locking area.

8) The invention of hot-rolled process is designed such that the components assembled rigidly within the hot-rolled processed locks are impossible to be tampered.