April 18, 1961 W. M. BROOKS 2,980,461

FOLDABLE, HASP-LOCKING SEAL

Filed March 3, 1960

Fig. 1.

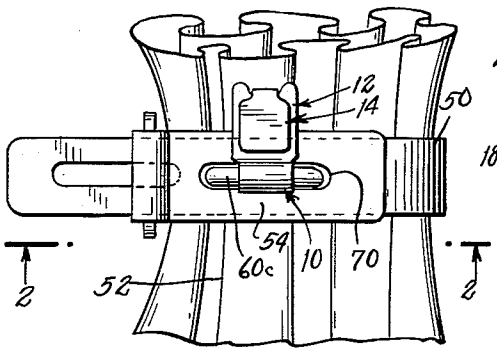


Fig. 3.

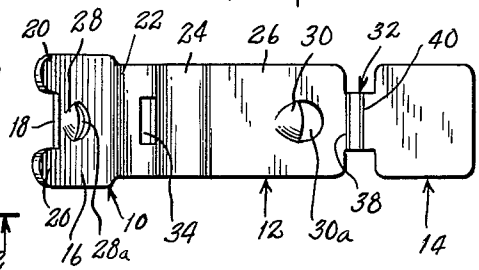


Fig. 2.

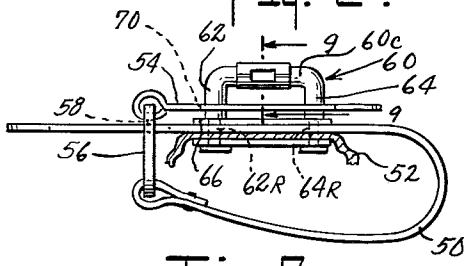


Fig. 4.

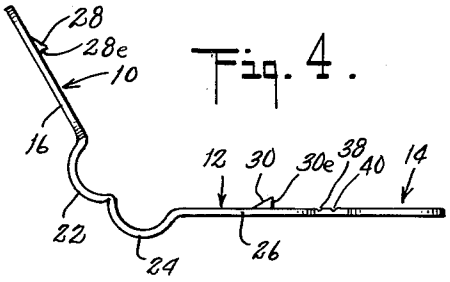


Fig. 7.

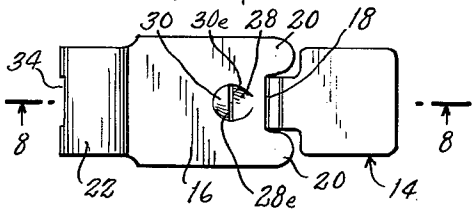


Fig. 5.

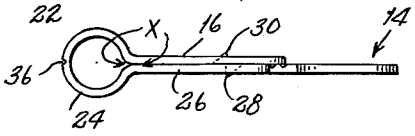


Fig. 8.

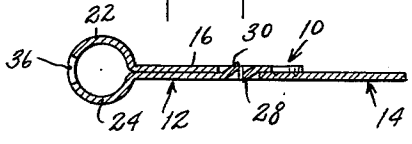


Fig. 6.

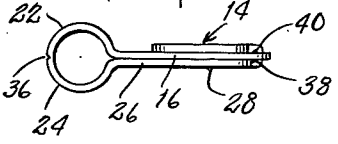
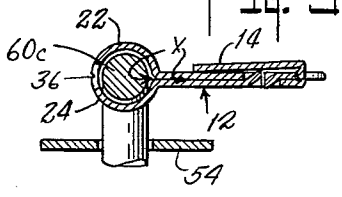


Fig. 9.



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FOLDABLE HASP-LOCKING SEAL

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4 Claims. (Cl. 292—307)

This invention relates to a locking and sealing device for application to a hasp eye for holding the latter in locked and sealed association with a related hasp plate.

An important object of the invention is the provision of such a device which can be economically produced.

Another important object is the provision of such a device which may not be removed from its locking and sealing association with a hasp assembly and then re-used.

Another important object is the provision of such a device which is small and light in weight and which may be very easily and quickly applied to a hasp assembly in locking and sealing relation thereto.

The foregoing and other obvious objects and advantages are achieved by the present invention, of which a single preferred embodiment is shown in the accompanying drawing for illustrative purposes; without, however, limiting the invention to the particular disclosed embodiment.

In the drawing:

Figure 1 is an elevational view of the device in locking-sealing association with a hasp assembly on a strap employed to close the neck of a bag of which only the upper portion is shown.

Fig. 2 is an elevational view of said device together with the strap and hasp assembly, and including a sectional view of the bag substantially on the line 2—2 of Fig. 1; said device, strap and hasp assembly appearing as viewed from said line.

Fig. 3 is an elevational view of the inner faces of the locking-sealing device; the latter appearing in open condition in which it is delivered by the manufacturer thereof to the user.

Fig. 4 is a side-edge view of the device in said open condition.

Fig. 5 is a side-edge view of the device in closed, but still unsealed, condition.

Fig. 6 is a side-edge view of the device in its closed and sealed condition.

Fig. 7 is a top elevational view of the device in its closed, but still unsealed, condition which corresponds to the condition thereof illustrated in Fig. 5.

Fig. 8 is a central, longitudinal, sectional view, substantially on the line 8—8 of Fig. 7, of the device in its closed, but still unsealed, condition corresponding to its condition as shown in Figs. 5 and 7.

Fig. 9 is a central, longitudinal, sectional view at the same plane as the view of Fig. 8, but showing the device in its closed and sealed condition corresponding to the condition thereof illustrated in Figs. 1 and 6; this figure also showing adjacent parts of a related hasp assembly.

The locking-sealing device shown in the drawing is preferably formed, by suitable metal-working operations, from sheet metal of such stiffness and bending and breaking characteristics as will enable the device to function as hereinafter described. These characteristics are quite well known to those familiar with the use of sheet metal for various purposes, and, even to those not so well versed, the characteristics of the metal suitable for use

in practicing the present invention may easily be determined with little or no experimentation.

The device, formed from a strip of suitable sheet metal, comprises an end locking section **10** at one end of the strip, an intermediate locking section **12** at an intermediate portion of the strip and adjoining section **10** in bendable relation thereto, and a sealing flap **14** at the other end of the strip and adjoining section **12** in bendable relation thereto.

The end locking section **10**, in its form as illustrated in the drawing, comprises a substantially flat portion **16**, the free end edge of which is recessed as at **18**, thereby forming similar end ears **20** at opposite corners of said free end edge. Substantially rigidly adjoining the flat portion **16**, oppositely from the recess **18**, is an arcuate, almost semi-cylindrical portion **22**, which portion and another hereinafter-mentioned similar portion will, for convenience, be referred to hereinafter as semi-cylindrical portions. Optionally, the portion **22** may be somewhat narrower than the flat portion **16**.

The intermediate locking section **12** is very similar to the end locking section **10** and includes a semi-cylindrical portion **24**, bendably adjoining semi-cylindrical portion **22**, and a flat portion **26** substantially rigidly adjoining the portion **24**. The dimension of the flat portion **26** longitudinally of the strip is substantially the same as the longitudinal dimension of the flat portion **16** if the latter is considered without the end ears **20**; and, in the device as illustrated, the curvature of the portions **22** and **24** in such that, when the sections **10** and **12** are bent toward each other from the condition of the device as illustrated in Fig. 4 to its Fig. 5 condition, the flat portions **16** and **26** will come into intimate face-to-face association as shown in the latter figure.

An important feature of this invention is the provision, in the flat portions **16** and **26**, of interacting detents **28** and **30** which protrude oppositely and inwardly of the related flat portions of the two locking sections, and each partially defines an adjacent, approximately semi-circular aperture **28***a* and **30***a* in the flat portions of the locking sections.

The apertures **28***a* and **30***a* are formed by cutting away approximately semi-circular portions of the metal of the flat portions **16** and **26**, and the detents **28** and **30** are formed by deforming inwardly, approximately semi-circular areas of metal which adjoin the apertures **28***a*, **30***a*; and each of said detents is substantially complemental to its adjoining aperture to define therewith a substantially circular area in its related flat section **16** or **26**. Thus, each of the detents has an edge, which edges are indicated as **28***e* and **30***e*, extending transversely of the strip. The edge **28***e* faces toward semi-cylindrical portion **22** and the edge **30***e* faces toward the sealing flap **14**. The detents and apertures are so located in their respective locking sections that, when those two sections are brought together as in Fig. 5, the detent **28** will nest into aperture **30***a* and the detent **30** will nest into aperture **28***a*.

The sealing flap **14** is preferably rectangular (substantially square as illustrated) and is integrally connected to intermediate locking section **12** by a neck portion **32** which is somewhat narrower than the width of recess **18**, and, when the device is closed but not sealed, as in Fig. 5, the neck portion **32** registers with said recess.

Lines of weakness are provided in the device to facilitate bending at certain points where bending is necessary in the closing and sealing of the device, and at one point in the device an aperture may advantageously be provided for a similar purpose. Thus, at the juncture of the semi-cylindrical portions **22** and **24** of the two locking sections, the device is formed with an elongate aperture **34** which extends transversely of the metal strip with its ends, however, terminating short of the side edges of

said strip. Also, at the same juncture, a line of weakness **36**, in line with and interrupted by the aperture **34**, is formed preferably to extend completely from opposite ends of the aperture **34** to corresponding, opposite side edges of the metal strip.

Lines of weakness **38** and **40** are preferably formed transversely and completely across the inner face of the neck portion **32**. The line of weakness **36**, together with the aperture **34**, facilitates folding of the locking sections **10** and **12** toward each other to bring the last-mentioned sections to their intimate face-to-face relationship shown in Fig. 5. The lines **38** and **40** facilitate bending of the sealing flap **14** upwardly and arcuately from its non-sealing position as in Fig. 5 to its sealing position as in Fig. 6. The fact that two lines of weakness are provided at **38** and **40**, rather than a single line of weakness, provides compensation for the thickness of the metal in locking section **10** and enables the sealing flap **14** to lie intimately upon and in face-to-face association with the flat portion **16** of the locking section **10**, as shown in Fig. 6.

When the device is locked and sealed as in Figs. 1, 6 and 9, the neck portion **32** seats within the recess **18** and thereby assures that the two locking sections **10** and **12** will be in transverse alignment, with the detents **28** and **30** respectively nesting properly in the apertures **30***a* and **28***a*. It may be observed, also, that the fact of such nesting, as just mentioned, serves additionally to hold the two locking sections **10** and **12** of the device against skewing and becoming transversely disaligned when the device is in use.

The several lines of weakness **36**, **38** and **40** have another and very important purpose in addition to the already-mentioned purpose of facilitating bending. This additional purpose is to constitute the device as a seal in the sense that, after having been properly applied and sealed to a hasp assembly, it may not be removed from said assembly and re-applied thereto because the device will break in one or more places. Thus, in opening the device, it is necessary to swing the sealing flap **14** back from its Fig. 6 position to a substantial extent toward its Fig. 5 position in order to permit the two locking sections **10** and **12** to be swung apart to open positions.

The described opening of the device involves substantial bending at lines of weakness **36**, **38** and **40**, and as such bending is in opposite directions to the bends given to the device at those lines of weakness when it was initially locked and sealed, it is quite certain that when the device, after having once been closed and sealed, is then opened, it will break at one or more of the mentioned three lines of weakness. However, even if such breakage does not occur when the device is opened, it almost certainly occurs at one or more of said lines of weakness if an attempt is made to re-use the device. The bending incidental to such attempted re-use, in addition to the bending which has previously taken place when originally applying and then opening the seal, is certain to have the effect of causing such breakage of the device that it cannot possibly be re-used. A substantial measure of safety is derived from this breakage characteristic in that seals employed as explained herein are usually utilized to prevent pilfering or tampering with the contents of a bag or other container or receptacle upon which it is applied; and such seals commonly are numbered and must be accounted for and cannot easily be duplicated or otherwise obtained.

The manner of usage of the disclosed locking-sealing device with a hasp assembly may easily be understood by reference to Figs. 1 and 2, showing a strap **50**, encircling the neck of bag **52**, and provided at one end with a hasp plate **54** which is pivotally connected to said strap end by a link **56** having an aperture **58** through which the strap **50** is introduced in forming a strap loop or shackle to extend around the neck of the bag.

Commonly, the strap and a hasp assembly associated therewith are fixed to a neck portion of the bag. For that purpose, a hasp eye **60** has clamping means associated with its legs **62**, **64** for securing it to the bag. Such clamping means may comprise a first washer **66** on reduced portions **62***r*, **64***r* of the legs **62**, **64** and lying against the outer face of the strap **50**. The reduced portions **62***r* and **64***r* extend through the strap and through the material of the bag **52**; and on said reduced portions, at the inner face of the bag, is a second washer **68** which is firmly and tightly held upon the legs of the hasp eye by spreading or riveting of the ends of the reduced portions **62***r* and **64***r*, so that the two washers operate to engage the strap and bag tightly therebetween. The hasp plate **54** is formed with an elongate slot **70** through which the hasp eye **60** extends when the hasp assembly is closed, as shown in Figs. 1 and 2. The present locking-sealing device in its condition as shown in Fig. 4 is introduced endwisely through the eye **60** and between the latter's cross member **60***c* and the strap **50**, after which the locking-sealing device is closed in the manner already explained.

A device of the character disclosed herein very effectively opposes attempts by unauthorized persons to open and re-use it. Such an attempt, for example, might involve the insertion of a long, thin instrument sidewisely or endwisely between the flat portions **16** and **26** approximately at a point indicated at *x* in Figs. 5 and 9. The insertion of an instrument at that point would be attempted to further an effort to pry the flat portions **16** and **26** apart to a sufficient extent that the detents **28** and **30** would clear each other to enable the end locking section **10** to be slid longitudinally of the strip from its position underneath the sealing flap **14**. Such an effort to open the device would not succeed because of the fact that, even though the parts of the flat portions **16** and **26** leftwardly of the detents (as viewed, for example, in Fig. 9) might be bent apart to some extent while causing little or no bending of the sealing flap **14** away from the locking section **10**, such bending would not suffice to destroy the abutting relationship of the detents **28** and **30** and, therefore, would not enable the device to be opened.

Moreover, if an interloper attempted to extend the bending of the flat portions **16** and **26** away from each other to an extent greater than just mentioned, the bending could not proceed to a sufficient extent to disengage the two detents unless the sealing flap **14** were bent very substantially upwardly, because of the fact that the bending of the sealing flap relatively to the other parts of the device and occurring at the neck portion **32**, occurs so close to the two detents that disengagement of the latter could not be accomplished except by a substantial unsealing, bending manipulation of the sealing flap.

It will be seen that locking-sealing devices according to this invention may be very economically produced of sheet metal, may be very easily applied to a hasp assembly and, while they may easily be removed from such an assembly when such removal is desired and authorized, nevertheless, removal by an interloper may not be accomplished without breaking the seal and thereby defeating possible re-use thereof.

I claim:

1. A locking-sealing device of sheet metal, comprising two integrally interconnected, substantially rigid locking sections, bendable relatively to each other along a first line of weakness between open positions in which said sections are substantially angularly separated and closed positions in which opposed faces of said sections are in close face-to-face relationship, and a sealing flap, integrally adjoining a first one of said locking sections along a second line of weakness parallel to said first line of weakness and bendable relatively to said first locking section to a sealing position in which, with said locking sections in said face-to-face relationship, said sealing flap closely overlies said locking sections with a second

one of said locking sections sandwiched between said first locking section and said sealing flap; each of said locking sections being provided with an aperture and being deformed, immediately adjacent to an edge of said aperture which edge extends in a direction generally parallel to said lines of weakness, to provide a detent which, on each of said sections, when the latter are in said face-to-face relationship, protrudes toward and in alignment with said aperture of the facing one of said sections with protruding edges of the two detents abuttingly overlapping each other to a substantial extent to prevent material shifting of said sections in one direction normal to said lines of weakness; the sheet metal at said sealing flap's interconnection with said first one of the locking sections constituting an abutment coacting with said second one of the locking sections to prevent relative shifting of the two locking sections in an opposite direction normal to said lines of weakness; and said detents being covered, at one side of the device, by said sealing flap, when the latter is in its said sealing position, to oppose tampering with said detents while the device is in sealed condition.

2. A device according to claim 1, said detents protruding toward the facing locking sections to such an extent and being in such close relationship to said second line of weakness that the two locking sections cannot be materially separated from each other without substantially bending said sealing flap from its said sealing position and thereby so weakening the metal at said second line of weakness that the sealing flap would break away from the remainder of the device upon any attempt to remove and reuse the same device.

3. A device according to claim 1, said second one of the locking sections having integral ears which, when the device is closed and sealed, extend close to opposite sides of the device at said second line of weakness to prevent material shifting of said locking sections in either of opposite directions parallel to said lines of weakness.

4. A device according to claim 1, said apertures constituting weakening means which weaken said locking sections to induce bending of said sections thereat in the presence of tampering, thereby opposing separation of said detents.

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