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SEALING DEVICE

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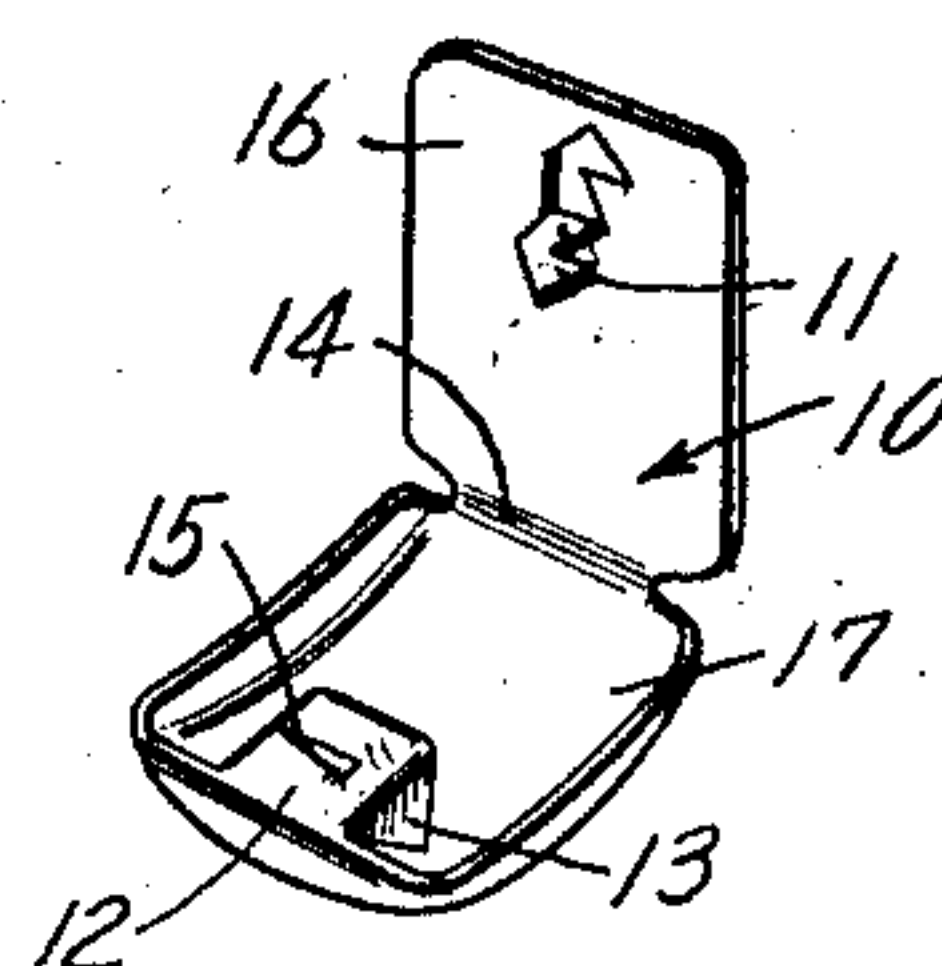
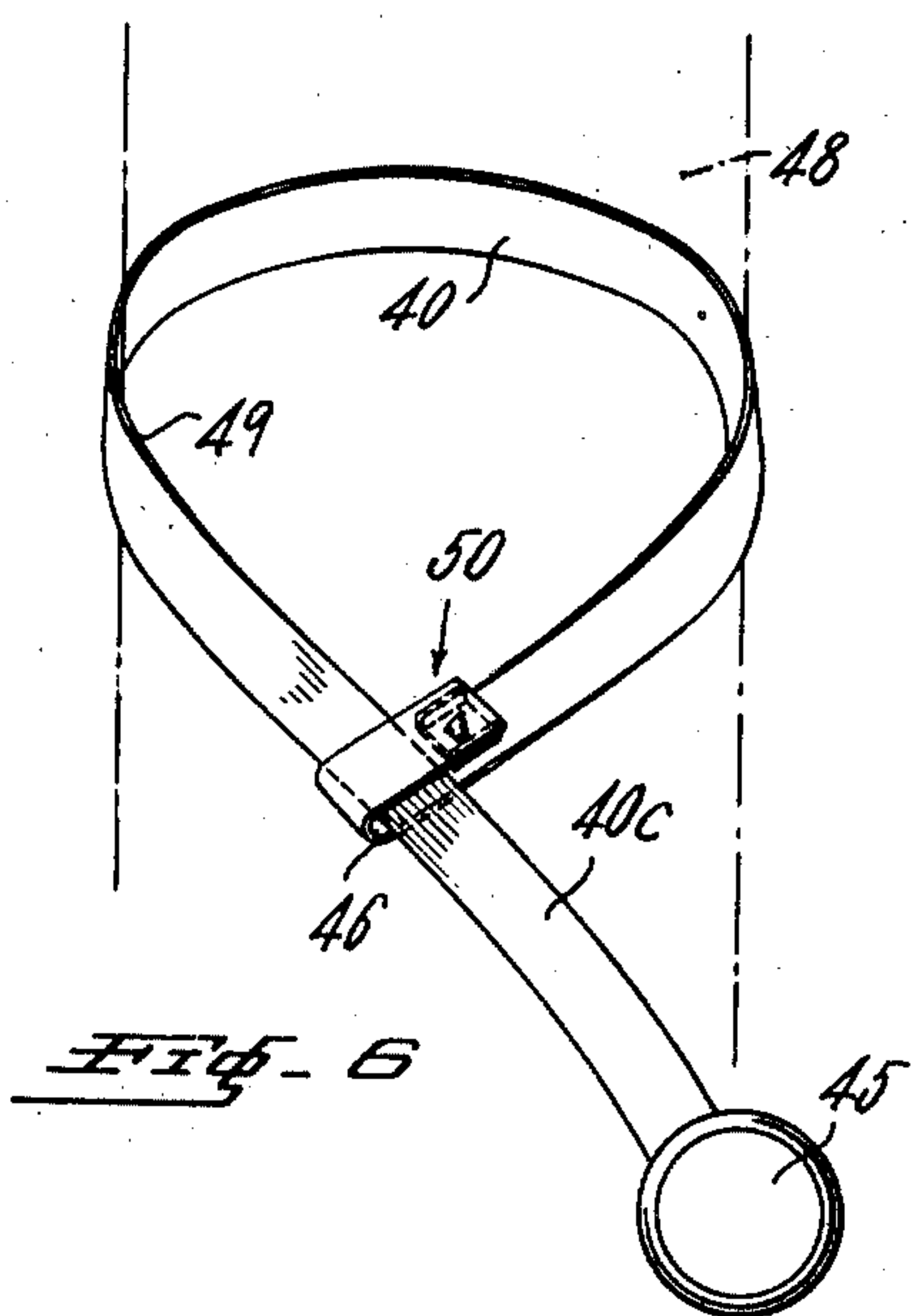
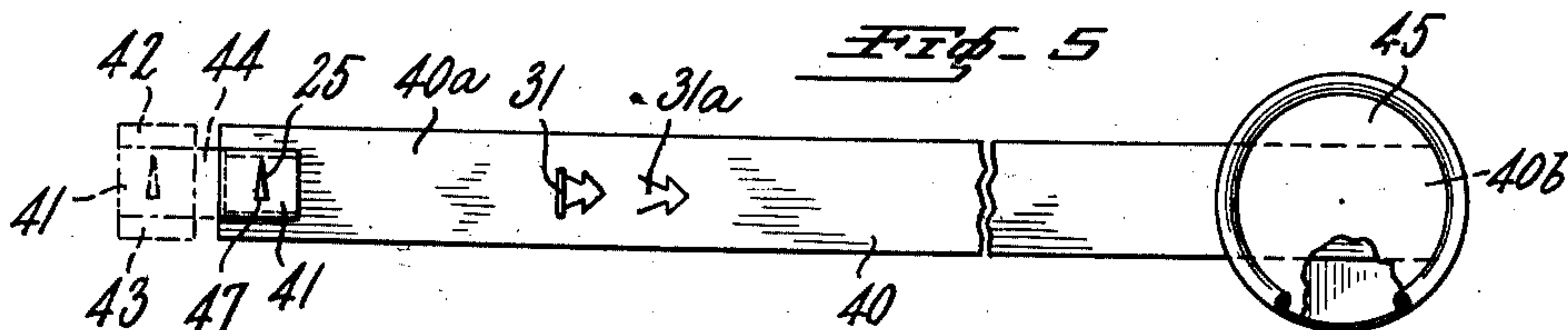
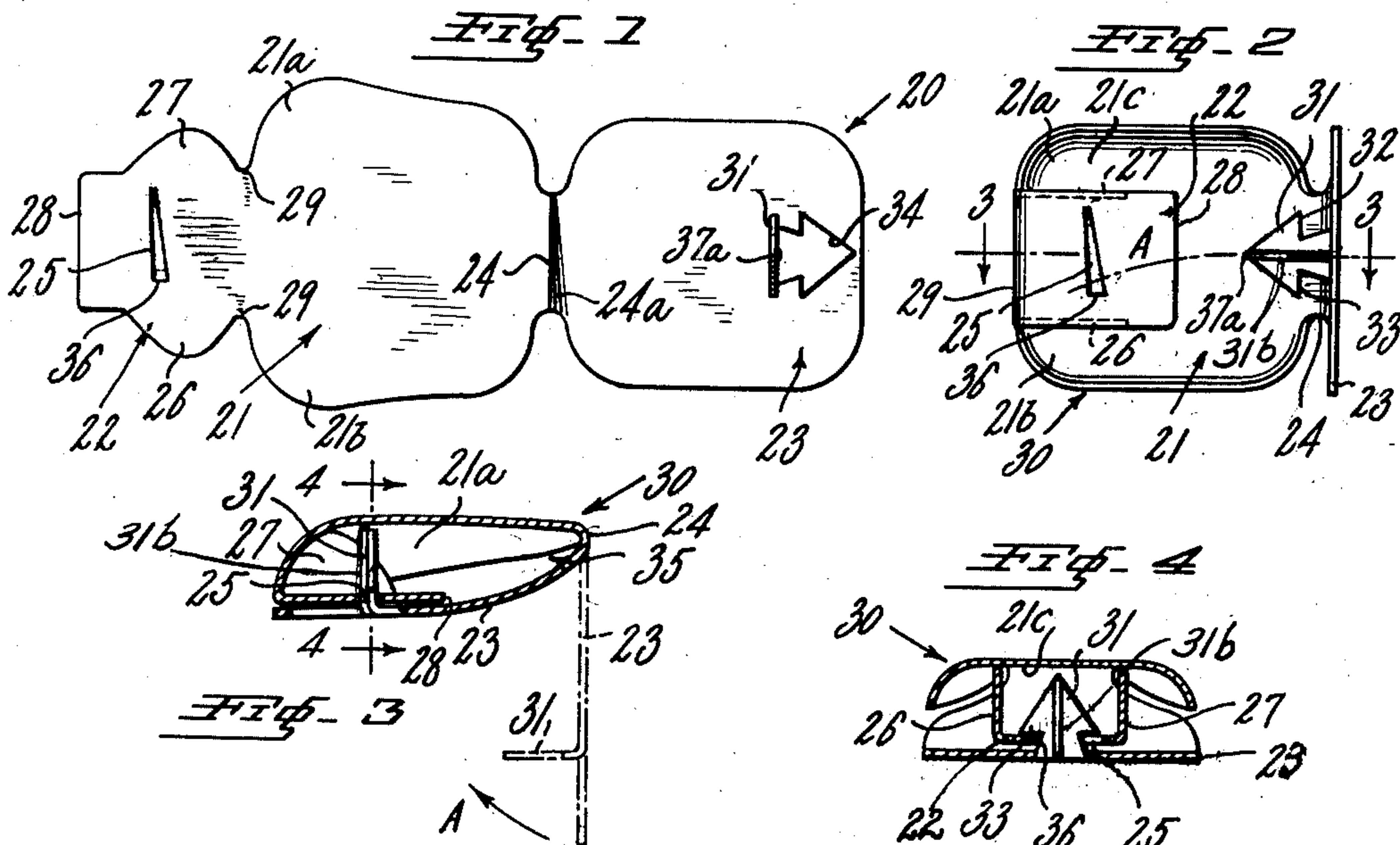


FIG-5a

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## SEALING DEVICE

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6 Claims. (Cl. 292—319)

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This invention relates to sealing or similar devices, in particular to tamper-proof and closeable devices adapted for attachment to suitable articles for marking or identifying the same.

It is one of the objects of this invention to provide sealing devices of the aforesaid nature which may be easily and inexpensively manufactured in mass production, may be readily operated without the employment of any tools and which are so shaped as to break if tampered with.

The invention further contemplates the utilization of certain properties, such as springiness, foldability and breakability inherent in the material of which the sealing device is made, to thereby bring about efficient closing action and prevention of re-opening of the sealing device.

It is another object of the present invention to provide means facilitating closing of the sealing device upon moving loop-forming parts thereof toward each other, while interlocking formations carried by said parts, respectively, are brought into engagement with each other for maintaining said parts in closed and locked position.

A still further object of the present invention is to provide means permitting the formation of the locking members as well as of the folding parts of the sealing device from a single stamped blank of one and the same material.

Yet another object of the invention is to provide means permitting the piercing of the article to be marked by one of the interlocking formations and to thereby fix said sealing device in position.

Still a further object of the present invention is to provide means affording the position of the interlocking members or formations within the interior and the inaccessibility of these members from without said sealing device so as not to invite tampering with said device.

These and other objects are accomplished and this invention accordingly consists of the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof as appearing on the attached drawings which illustrate several embodiments thereof. These embodiments are shown for the purpose of illustrating the invention since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various parts of which the invention consists are not limited to the precise arrangement as herein shown and described.

In the drawings:

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Fig. 1 is a top plan view of a stamping or blank embodying the invention;

Fig. 2 is a top plan view of an open sealing device, made in accordance with the invention, one flap of the device being shown at right angle to the other flap thereof;

Fig. 3 is a sectional view of the sealing device taken along line 3—3 of Fig. 2, but shown in closed and locked condition;

Fig. 4 is a cross-section taken along line 4—4 of Fig. 3;

Fig. 5 is a top plan view of the sealing device according to the invention and as applied to a lengthy strip of material, to which reference is made in the specification;

Fig. 5a shows in perspective a sealing device in modified form according to the invention; and

Fig. 6 illustrates in perspective the application of the device of Fig. 5 to a round object (indicated in dot-dash lines).

Referring now more particularly to the drawings, there is shown in Fig. 1 a blank 20 made of sheet material from which the sealing device 30 (seen in Figs. 2 to 4, inclusive) is manufactured. Any suitable sheet metal, such as aluminum, steel and the like, may be used to arrive at the sealing device made in accordance with this invention. However, it is well understood, that any other material, e. g. plastic or plastic compositions having certain properties of which the present invention makes use, may be employed for attaining function and result of this invention.

Blank 20, in the present instance, is composed of two parts, namely, a main part or flap 21 having the reduced extension 22 and a co-operable part or flap 23. A fold line 24 hingedly connects parts 21 and 23 so that these flaps may be swung or moved toward each other for the purpose of closing and locking the sealing device 30. The fold line 24 may be weakened in any appropriate manner, such as by perforations or by reducing the thickness of the wall thereat.

Extension 22 is provided with a slot 25 and side portions 26, 27. Slot 25 is arranged substantially between the forward edge 28 of extension 22 and a fold line 29 which connects extension 22 to flap 21.

Flap 21 has outwardly extending portions 21a, 21b, whereas flap 23 has a punch member 31 with lateral projections or barbs 32, 33, which member is preferably struck out and bent out of the plane of the material of flap 23, so that an opening 34 corresponding to the shape of member 31 remains in said flap 23.



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Upon obtainment of the preferably stamped blank 20, the same is submitted to a forming operation by which flap 21 is hollowed and bulged and whereby the portions 21a, 21b of flap 21 will be rounded and assume a slightly dipped shape adjacent to fold line 24, as clearly seen in Figs. 2 and 3. Extension 22 is then folded about fold line 29 over flap 21, while the side portions 26, 27 of extension 22 are bent at right angles with respect to the extension 22, so as to abut against the inner wall 21c of the hollowed flap 21 and to prop extension 22 in position thereat. Slot 25 of extension 22 comes thus to lie between fold line 29 and the straight forward end 28 of extension 22. After the punch member forming tine 31 is struck out of the material of flap 23 and bent substantially at a right angle to flap 23, the latter is swung about fold line 24—24a for co-operation with flap 21, thereby forming a closed loop 35 between flaps 21 and 23 upon engagement of punch member 31 with die member 22 including slot 25 thereof.

It will be observed from Fig. 2 that the pointed end 37a of punch member 31 is substantially out of alignment with respect to the center of slot 25 which, in this particular instance, is key-shaped. It will be seen from Fig. 2 that lateral projections 32, 33 of member 31 are so arranged with respect to the length of slot 25 that upon swinging of punch member 31 in the direction of arrow A to enter slot 25, lateral projection 33 will meet the edge of end wall 36 of slot 25 and will ride on said edge for being shifted, when entering slot 25 (under pressure exerted by the thumb of the hand of a person), in lengthwise direction toward the reduced end of slot 25 and assume a position as indicated in Fig. 4.

Due to the springiness of the material of flap 21 and its tendency to swing back about fold line 24 (after release of flap 23 by the thumb), lateral projection 33 will assume its original position with respect to the retaining edge of end wall 36 (as indicated in Fig. 4). Thus, lateral projection 33 is held at a location beyond said slot and comes to lie behind end wall 36 with which it engages. Punch member 31 is thus effectively prevented from disengagement from slot 25.

As depicted in Fig. 4, lateral projection 32 is also held to extend beyond slot 25 and within a hollow housing defined by bent side portions 26, 27, extension 22 and inner wall 21c.

It is contemplated to shorten somewhat the length of slot 25 with respect to the width of punch member 31 at its lateral projections 32—33 so that member 31 must be pushed through slot 25 with force (in a punch-and-die fashion) and will thus not be permitted to be released from slot 25, even if flap 23 would be shifted in lateral direction with respect to flap 21. It is further preferred to make the slot 25 key-shaped and oblique with respect to edge 28 to prevent disengagement of punch member 31 from slot 25 under all circumstances.

In order to further the safety of the sealing device 30 and do away with tampering, etc., the fold line 24 between flaps 21 and 23 may be weakened in any appropriate manner, as above explained, and/or may be so shaped and a twist imparted to it, as at 24a that flap 23 will have the enhanced tendency of moving sidewardly in the direction of barb 33, whereby displacement of tine 31 with respect to slot 25 is avoided to an even greater degree.

It is well understood that instead of two lateral projections or barbs 32 and 33, only a single lat-

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eral projection may be provided at punch member 11 of sealing device 10. Slot 15 in die member 12 with side extensions is shaped accordingly to fulfill the purpose of the invention, as hereinabove described. Flap 16 is swung about fold 14 toward flap 17 in closed condition of said device (see Fig. 5a).

In the instance seen in Figs. 1 to 4, punch member 31 and end wall 36 of slot 25 form the co-operable or interlocking formations of the sealing device 30 which upon swinging of flaps 21 and 23 toward each other become engaged, whereby tine 31 is spaced a sufficient distance from the inner surface or wall 21c of flap 21, so that punch member 31 will not be subjected to any bending or deforming operation and projection 33 is firmly retained in position behind and by end wall 36.

It will be evident from the drawings, that the pointed or arrow-shaped end 37a of tine 31 (forming the punch) before entering slot 25 (of extension 22 forming the die member) may pierce any suitable article, e. g. a bag, for sealing or closing the same or the wing of a turkey or other livestock etc., to identify the same, so that upon ensuing engagement of the interlocking formations (punch member 31 and slot 25) a tamper-proof sealing device is joined to the article.

Fig. 5 shows the incorporation of the sealing device of Figs. 2 to 4 in a strip of material 40. The slot 25 of extension 41 is engageable with tine 31 stamped and bent out of plane of strip 40 in the manner similar to that hereinbefore described with respect to Figs. 1 to 4. As can be seen in Fig. 5, one end of strip 40 is so shaped that extension 41 is provided having side portions 42, 43 which are subsequently bent at right angles (similar to side portions 26, 27) to the remainder of said extension, which is then folded about a strap portion 44 (indicated in dotted lines) to assume a position similar to that of extension 22 (as seen in Fig. 2). Strip 40 is further provided with a plurality of pre-indicated or scored, spaced members 31, 31a for the purpose of readily adjusting the length of the loop-forming portion 40a of strip 40 which is positioned between slot 25 and member 31 or 31a, as the case may be.

It is further evident from Fig. 5 that the end 40b of strip 40 is enclosed within a curled seal 45 of known construction which seal may bear any appropriate inscription or identifying matter, if desired. It is to be observed that the diameter of seal 45 should be substantially larger than the loop 46 obtained upon engagement of the interlocking formations (31 or 31a with end wall 47 of slot 25) so that upon closing of the loop 46 by means of the sealing device 50 (Fig. 6), seal 45 will be prevented from being slipped through loop 46, whereas the sealing device 50 in closed condition will also be prevented from being tampered with, as hereinabove described with respect to sealing device 30.

The sealing device 50 as shown in Fig. 6, may be readily applied to the stem or trunk of a tree 48 of a nursery and has the advantage that with the growing and expansion of the tree trunk 48 the loop 49 of strip 40 will readily adjust itself but nevertheless will prevent seal 45 to be disengaged from loop 46, although end 40c extending between loop 46 and seal 45 may slide through said loop 46 for the enlargement of loop 49 according to needs.

As will be seen from the aforesaid disclosure, the interlocking formations are preferred to be located remote from the ends of the co-operable



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parts of the sealing devices, that the tines or locking pins of the sealing devices will not undergo any deformation when brought into locking position and that the spring action of the material will effectively contribute to the prevention of dislodgement and displacement of the locking formations with respect to each other in closed condition of the sealing devices.

It is to be noted that instead of the seal element 45 hereinabove referred to, any other obstructing means, either formed from strip 40 or attached to the same, may be employed to prevent disengagement of the end of strip 40 from loop 46.

It will be further realized that punch member 31 of the embodiment shown in Figs. 1 to 4, may be reinforced by a rib 31b so as to prevent any accidental breakage of punch member 31.

Although member 31 is shown arranged a predetermined distance from the end of flap 23, it is self-understood that such member may be arranged also at the end of flap 23 and may project therebeyond.

Shape and form of the retaining member or members 32, 33 may be varied in accordance with the shape of the sealing device and the purpose for which it is intended.

It can thus be seen that there has been provided, in accordance with the present invention a sealing device used for the attachment to articles and the like; a piece of springy sheet material folded to form two flaps, said flaps being adapted to be moved against spring action toward and for cooperation with each other, an elongated member provided in one of said flaps and including a barb, the other flap including an extension folded over said other flap, said folded extension being provided with an opening having an end wall and positioned for cooperation with said barb of said elongated member, said elongated member and said barb being adapted to pass through said opening for position of said barb beyond said opening and between said folded over extension and said other flap, whereby said barb is locked by the engagement thereof with said end wall and maintained in position under spring action.

In accordance with the above, it is well understood that deviations and changes may be made from the embodiments herein set forth without departing from the spirit of the invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A sealing device of the character described comprising a lengthy strip of material, a perforated extension at one end of said strip and folded upon said strip, a plurality of spaced apart locking means provided on said strip and co-operable with said opening of said extension, whereby upon insertion of one of said locking means in said opening said one locking means is retained between said extension and that portion of said strip of material upon which said extension is folded, the other end of said strip being threaded through the loop obtained upon closing of said locking means, and means obstructing the passage of said other end of said strip of material through said loop.

2. A sheet metal sealing device comprising two flaps foldable upon each other in closed condition of said device, a die member on one surface of one of said flaps and including an elongated opening above said one surface, a piercing punch member struck out of the plane of said other

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flap and bent in a direction to cooperate with said opening of said die member of said one flap, said punch member being reinforced by a rib and adapted in cooperation with said die member to pierce an article to be sealed when placed on said die member, and respective means on said punch member and on said die member to lock said sealing device in closed position and subsequent to said piercing operation, said die member opening being spaced a sufficient distance from said one surface to prevent engagement of said punch member with said one surface in said locked position.

3. A sheet metal sealing device comprising two flaps foldable upon each other in closed condition of said device, a die member on one surface of one of said flaps and including a wall defining an elongated opening above said one surface, a piercing punch member bent out of the plane of said other flap and in a direction to cooperate with said opening of said die member of said one flap, said punch member including an arrow-head-shaped part and being adapted in cooperation with said die member to pierce an article to be sealed when placed on said die member, and respective means on said punch member and on said die member to lock said sealing device in closed position and subsequent to said piercing operation, said die member opening being spaced a sufficient distance from said one surface to prevent engagement of said punch member with said one surface in said closed position.

4. In a sealing device used for attachment to pierceable articles and consisting of a folded piece of sheet material providing two flaps which are adapted to be moved toward and for cooperation with each other; a punch member positioned rearwardly of the forward end of one of said flaps and provided with a forward pointed end and at least one lateral projection, said pointed end being adapted to pierce said article, the other flap being provided with an inner surface and with a portion having an opening disposed for position above and spaced from said surface, said pointed end together with said projection being adapted to pass through said opening to a location beyond said opening but short of said surface of said other flap, and means forming part of said portion of said other flap and engageable with said projection of said punch member for locking the latter in position beyond said opening, said pointed end of said punch member when the latter is in locked position being spaced from the surface of said other flap to prevent engagement of said pointed end therewith.

5. A device according to claim 4, wherein said punch member is disposed to normally extend out of the center of said opening, whereby in said locked position said projection engages said portion of said other flap of said device.

6. A sheet metal sealing device comprising two flaps foldable upon each other in closed condition of said device, a die member on one surface of one of said flaps and including an elongated opening above said one surface, a piercing punch member bent out of the plane of said other flap and in a direction to co-operate with said opening of said die member of said one flap, said punch member being adapted in cooperation with said die member to pierce an article to be sealed when placed on said die member, and respective means on said punch member and on said die member to lock said sealing device in closed position and subsequent to said piercing operation,



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said die member opening being spaced a sufficient distance from said one surface to prevent engagement of said punch member with said one surface in said closed position, said flaps being connected to each other at their fold line so that said punch member is disposed laterally out-of-alignment with respect to said opening of said die member through which said punch member passes for engagement of said respective means to interlocking position.

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