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BINDER STRAP SEAL

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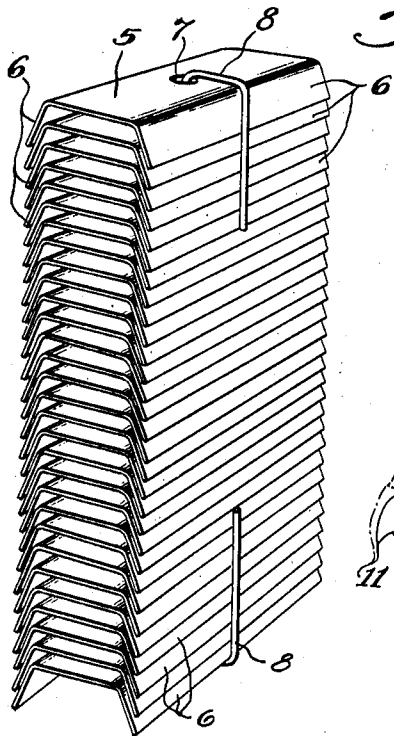


*Fig. 1.*

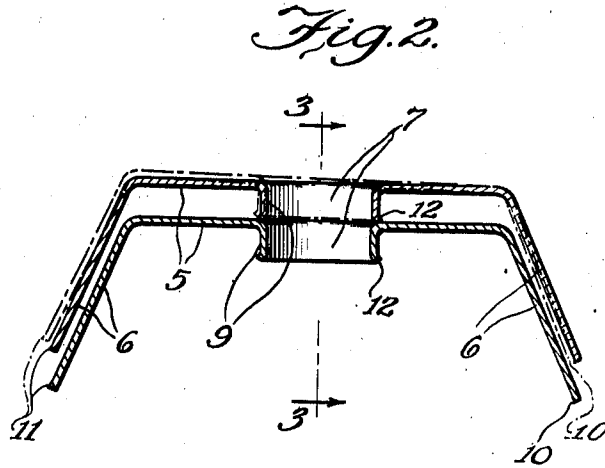


*Fig. 2.*

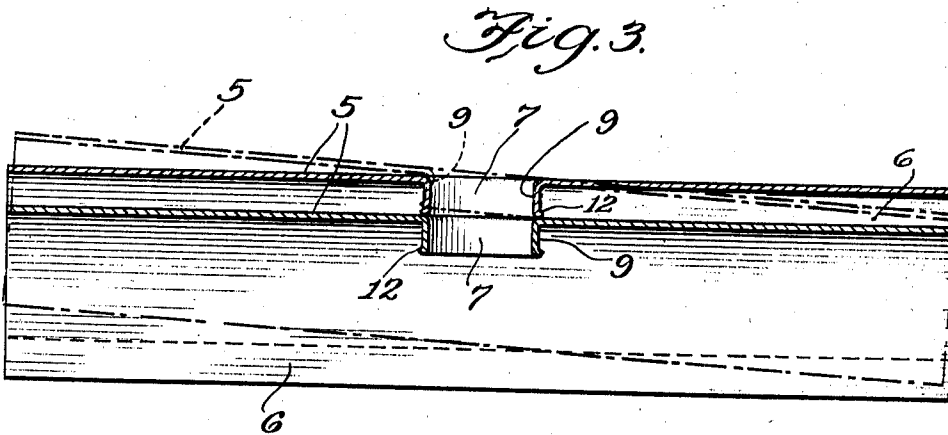


*Fig. 3.*

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## UNITED STATES PATENT OFFICE

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## BINDER STRAP SEAL

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3 Claims. (Cl. 24—23)

My invention relates to binder strap seals such as are employed to embrace more or less overlapping ends of metallic package binder strap and by deformation therewith to provide a tension resisting and molestation detecting joint between the strap ends.

The principal objects of my invention are to provide an interesting or stacking type of seal with improved means for insuring proper spacing and permitting some degree of tilting movement between adjacent seals in a stack. In its preferred embodiment, the permissible movement is a tilting both laterally and longitudinally.

Another object is to provide such a seal wherein the formation of the spacing means provides a hole through the back whereby, when a plurality of seals are interested to form a stack, the holes of all align and a securing means, such as a wire, may be passed through all of the seals of the stack to hold them together for handling and shipment.

Other objects and advantages will hereinafter appear.

The preferred embodiment of the invention is shown in the accompanying drawing wherein:

Fig. 1 is a perspective of a stack of seals secured together by wire;

Fig. 2 is an enlarged transverse section through the middle of two adjacent seals, such as those making up the stack shown in Fig. 1; and

Fig. 3 is a central longitudinal section through the seals on the line 3—3 of Fig. 2.

In general, the seal comprises a single piece of sheet metal bent to form a conventional seal having a substantially flat back plate and a pair of outwardly and downwardly flaring flanges along opposite sides of the back plate. A hole is punched through the back plate so as to leave an inwardly projecting flange—or burr as it may be termed—about the rim thereof which serves as a spacer between interesting adjacent seals. The hole formed in the back plate will align with those of other like seals in a stack so that a wire or other securing agent may be passed through them to hold the seals together in a stack for handling and shipment. In the preferred embodiment illustrated in the drawing, a circular hole is provided in the back plate, at the longitudinal and lateral center, so that when a plurality of seals are interested in a stack, they may pivot on each other to a certain extent both transversely and lengthwise. Such capability of limited movements is advantageous in inserting

seals into storage magazines of sealing tools, particularly where it is desirable or necessary to curve the magazine to conserve space or for other reasons, and in the feeding of seals one at a time from the stack in a magazine to the sealing mechanism or point of application to the overlapping strap ends.

Referring now to the drawing, the seal, which is preferably formed by a bending operation from a single piece of mild sheet steel—initially rectangular—, has a flat back plate 5 and two similar side flanges 6. Flanges 6 lie along the lateral edges of back plate 5 and extend outwardly and downwardly therefrom to form a flaring channel shaped structure of conventional shape adapted to fit partly about the overlapping ends of a package binder strap and, by a suitable tool, to be deformed with the strap ends to form a joint. The thickness or gauge of the metal and the size of the finished seal may be varied, depending upon the size of the strap and the strength of the joint desired.

Approximately at its longitudinal and transverse center a circular aperture 7 is punched through back plate 5 to form, among other things, a round hole which when a plurality of similarly formed and apertured seals are interested to make a stack, will align with the holes of the other seals. Thus the holes of all seals in the stack will provide a bore through which a securing agent 8, such as a wire, can be threaded and, when the ends are bent as shown in Fig. 1, insure that the seals remain nested together in stack form in a manner Fig. 1 clearly indicates.

In the punching operation the metal displaced from the back plate to form the hole 7 is bent inwardly or downwardly and drawn or swaged to form an upstanding flange 9 rimming the hole, as clearly shown in Figs. 2 and 3. And this flange may constitute an abutment or spacer for insuring proper separation of the back plate and flanges of one seal from the back plate and flanges of the nested adjacent seal which, in the ejection of seals one at a time from a stack stored in a magazine, has been found to be a desirable if not a necessary condition. Such spacer flanges and the slight movements permitted thereby may also compensate for inequalities in the formation of the seals and in the gauge of the metal from which they are formed so that the cumulation in a stack of the inequalities in individual seals will not produce, for example, a crooked stack.

Another advantage derived from this arrangement for normally separating the flanges, particularly the edges of the flanges, of adjacent seals in a stack, arises from its overcoming a difficulty inherent from the punching of seal blanks from sheet steel stock—which is the preferable method of producing them. Thus in the punching operation for the production of seal blanks in commercial quantities, small burrs 10 and 11, usually projecting only a few thousandths of an inch, are formed along the edges of the blank. Expense usually will prohibit the removal of these burrs by grinding or other procedure. Such burrs along the edges of the flanges of nested seals tend to bite into the flanges of the adjacent seals with the result that the longitudinal separation of seals from the stack during the operation of feeding them from a storage magazine, is made more difficult. Furthermore, the burrs tend to scratch the outer surfaces of the flanges of adjacent seals and mar or disfigure them—particularly if the outer or exposed surfaces of the seals are finished, such as lithographed with names, trade-marks and the like, which is often the case. These difficulties are overcome, without the necessity of removing the burrs, by the separation of the edges of the flanges of adjacent seals in a stack. Ordinarily the size of the wire to hold the seals together in a stack and the relation between the size of the wire and the size of a hole are not matters of much consequence so that the amount of separation between seals can be governed by the size of the hole—in general the larger the hole the deeper the spacing flange and consequently the more the separation between the back plates of adjacent seals.

Preferably in the formation of the hole through the back plate and the upstanding flange rimming that hole, the punch and die are so arranged that the lower edge of the flange 9 is given a slight outward flare 12. This flare, which slightly enlarges the outer periphery of the extremity of flange 9, serves to prevent the flange of one seal from entering the hole in the adjacent seal, the entrance to which will be slightly rounded and enlarged as is clearly indicated in Figs. 2 and 3. Thus, it insures that the seals of a stack will not be interlocked and may readily be slid longitudinally relative to each other, and thus the feeding from the magazine is not interfered with. And the formation of this flare by a punch and die operation has the effect of insuring proper height for the spacer flange and reduces inequalities or undue roughness in the edge of the flange which otherwise might result from the punching of the hole and the drawing or swaging of the spacer flange from the metal removed from the back plate thereby.

The flange, being of a diameter which is small relative to the area of the seal back plate, and being located at the longitudinal and lateral center of the back plate, permits considerable tilting or rocking movement between adjacent seals, both transversely and lengthwise, without destroying or materially altering the interesting

relationship. The transverse tilting is indicated by the dash lines of Fig. 2, and the longitudinal tilting is indicated by the dash lines of Fig. 3. Of course, it will be apparent that tilting in the opposite direction is also possible. Consequently, while still in a stack, the seals may be rocked or tilted, either transversely or lengthwise, relative to each other. This capability of tilting or rocking movement between the seals of a stack is frequently of considerable advantage since, for example, proper operation of the ejector in a magazine type tool or machine is more likely to be insured without the necessity for close tolerances in the gauge or thickness of or the spacing between seals. Also there is less tendency for seals to bind in passing through or from the magazine. And sometimes it is necessary or desirable that the magazine be curved and the tilting or rocking capability will enable the stack to be fitted to the curvature of such a magazine. Of course, if tilting to the full extent permitted by one longitudinally and laterally central spacing flange is not desired, several holes and flanges may be provided. And if projections from the back surfaces of the back plates are not objectionable—usually they are because of interference with arranging bound packages in piles and because of danger of injury to packages or handlers—the holes may be punched in the opposite direction to form the flanges on the outer surfaces of the back plates.

Having thus illustrated and described the nature and the preferred embodiment of my invention, what I claim and desire to secure by United States Letters Patent is as follows:

1. A strap seal which is internestable with like seals and has a back plate and similar outwardly and downwardly flaring wings extending from the opposite lateral edges of the back plate, characterized by the provision of a hole in the approximate lateral and longitudinal center of the back plate, the hole being substantially completely rimmed by a flange for spacing the back plate from an adjacent internested seal, and permitting both longitudinal and lateral tilting movements between adjacent seals.

2. A strap seal which is internestable with like seals and has a back plate and similar outwardly and downwardly flaring wings extending from the opposite lateral edges of the back plate, characterized by the provision of a hole through the back plate, the hole being substantially completely rimmed by a flange which projects from the back plate on the same side as the wings.

3. A strap seal which is internestable with like seals and has a back plate and similar outwardly and downwardly flaring wings extending from the opposite lateral edges of the back plate, characterized by the provision of a circular hole through the back plate, the hole being rimmed by an upstanding flange which forms an abutment for separating the back plate of the seal from the back plate of a like seal internested therewith and the flange being flared outwardly at its lower end.

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