

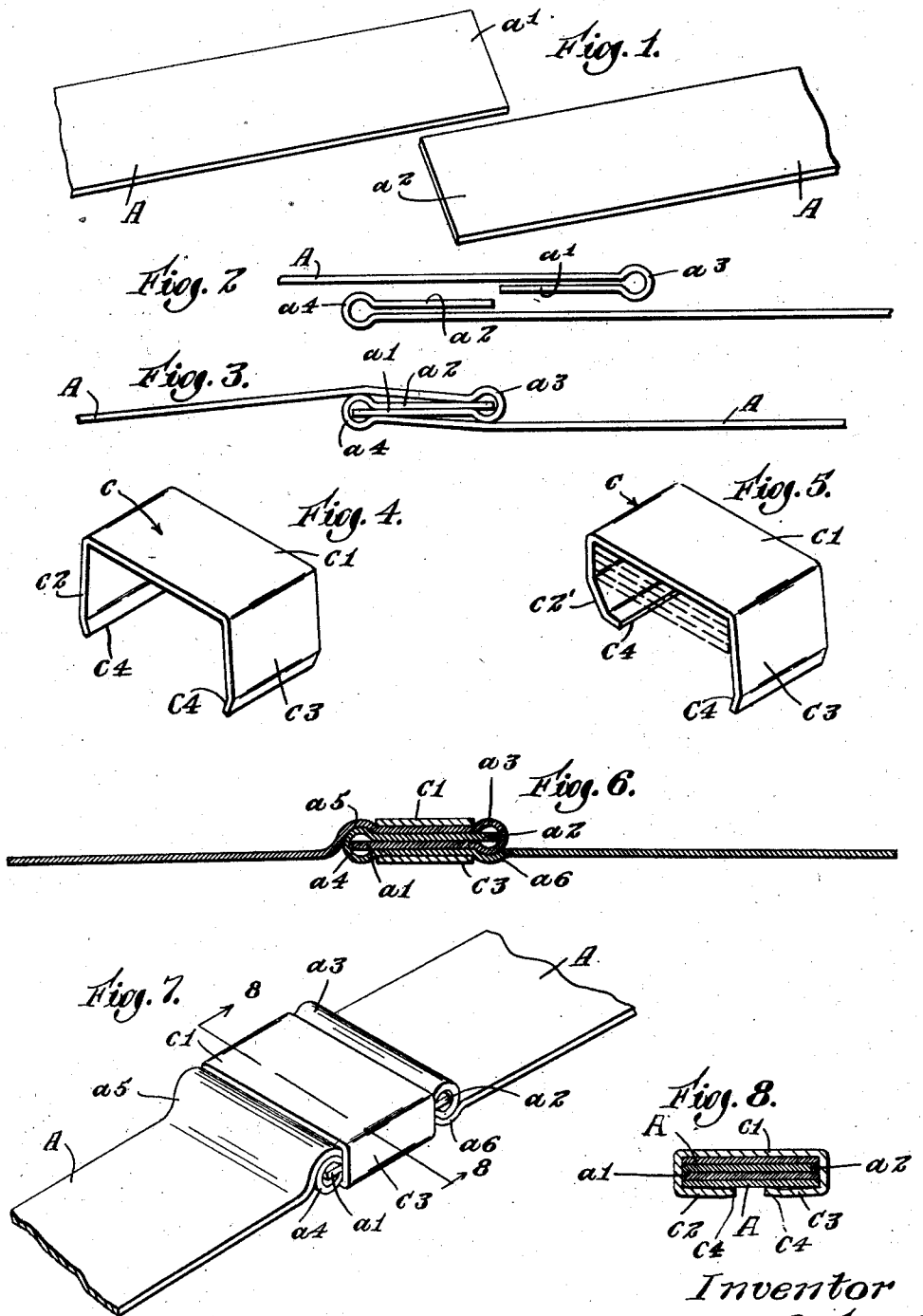
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METHOD AND MEANS FOR FASTENING BANDS ABOUT BALES OR THE LIKE

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METHOD AND MEANS FOR FASTENING BANDS ABOUT BALES OR THE LIKE

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This invention relates to improved methods and means for fastening a band about a bale or the like.

For many years it has been the practice to reinforce bales, boxes and other packages by wrapping metallic bands about them. These bands must obviously be strong enough to perform their function and withstand the unavoidable rough usage incident to handling and transportation and yet it is highly desirable that these bands be very thin, light in weight, and lie as close as possible to the surface of the package. The bands should preferably be narrow as this cuts down the weight and cost of each and enables several such narrow bands to be used instead of one or two wide ones with improved distribution of the reinforcing effect. While all these desirable characteristics have been attained so far as the band itself is concerned, it is still somewhat of a problem to fasten the ends of each band together so that the joint will be no weaker than the band itself and so that this joint will not project or stand out appreciably from the surface of the package. It has been customary to overlap the band ends and bind them together either by material deformation or crimping of the band, or by actually cutting it and piercing it so that a rib or tongue on one band end will be forced into a notch or hole in the other. Frequently some sort of a seal or reinforcing girth is added being in some manner laid over the overlapped ends of the band and simultaneously crimped, cut or deformed with them. Where the band's ends are thus sharply bent or crimped, its normal tensile strength is necessarily reduced, and even when this is partly compensated for by the added strength of a seal, the joint as a whole is in most cases weaker than the undisturbed portion of the band and is considerably thicker than the band itself and stands out from the surface of the package causing difficulty in the piling of the packages evenly. Moreover any projecting joint is always a source of danger in the handling because it may be struck and broken or may catch on other bales and boxes with damaging effect.

It is among the objects of this invention to provide for the fastening of band ends in such manner and by such means that the tensile strength of the band will in no wise be impaired. Quite to the contrary it is a feature of the invention that the joint of the band ends is really stronger than the band itself and yet scarcely thicker, it being a distinct accomplishment of this invention that the finished joint does not stand out from the surface of the package to an extent appreciably greater than the band itself. It is also an object of the present invention to provide a seal which is extremely simple both as respects its make-up and its application and yet effective to serve its purpose.

The present invention provides for the interlocking of the band ends together in such manner that the pull will for the most part be absorbed by the band itself and only a small component of this pull be imposed upon the seal thus enabling the latter to be applied easily and quickly. A further feature is found in the novel manner in which the strap ends are bent to guard against any breaking of the strap or any inadvertent catching of the joint on anything which might tend to disturb it.

These objects and the features which characterize this invention are attained by forming the band ends into hook-shape, each end being looped back upon itself by a gentle or rolled bend, as distinguished from a sharp bend or crease, so that the band is in no wise weakened or in danger of breaking where the loop occurs. These hooked ends are then interlocked so that one resists the pull of the other, such pull for the most part being entirely absorbed by the band with but a slight component of this pull tending to unfold the respective loops. This tendency is entirely overcome by the novel seal of the invention which in its simplest form may have a flat plate portion as wide in one direction as the width of the band and as long in the other direction as the distance between the gentle folds of the band ends. At the edges of the plate portion are two depending flanges each of which extends at an obtuse angle to the plate portion but one of which, in the pre-

ferred form, is also bent under slightly so as to hook about the edge of the interlocked band ends. The bottom edge of each flange portion is turned inward slightly so that when the flange portion is finally pressed toward the band ends, there will be a tight engagement of the turned-in edge with the bottom surface of the lower or inner band end. The seal is applied by simply placing it over the interlocked ends between their respective loops, being applied perpendicularly thereto if both flanges are of the same shape, or being applied at an angle, if one flange is bent inward, so that this bent flange may pass down by the edges of the interlocked ends and, with these edges serving as an axis, enable the seal to be turned about the interlocked ends so that the other flange slips by the other edges of the ends until the plate portion of the seal lies flat on the interlocked ends between these respective loops. The flange portions of the seal are then fully turned under the interlocked ends and pressed against the lower or inner surface thereof, the flange portions nesting between the loops or bends on the under side as does the plate portion of the seal on the upper side. Accordingly the seal can not possibly slip along the band or be disturbed by anything coming into contact with the joint for the loops or bends of the band protect the seal from being caught. Moreover loops of the joint are also protected by bending the band adjacent thereto so that it will serve as a sort of shield. And withal, the joint is unusually thin and does not bulge or project outward appreciably from the surface of the package.

It is intended that the patent shall cover by suitable expression in the appended claims whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawings:

Figure 1 is a perspective of the ends of a band in position to be joined together;

Figure 2 is a side view showing how the ends are bent into hook-shape;

Figure 3 is a side view showing the hook ends interlocked together;

Figure 4 is a perspective, on enlarged scale of a seal;

Figure 5 is a similar view of the preferred form of seal;

Figure 6 is a longitudinal sectional view showing the seal applied to the interlocked band ends;

Figure 7 is a perspective of the band's ends and seal as they appear in the finished joint; and

Figure 8 is a cross-section as on line 8—8 of Figure 7.

Referring more particularly to the drawings, the band A may be assumed to have been wrapped about a package, and cut off leaving its two ends a^1 and a^2 in overlapped relation. This amount of overlap is fixed,

being determined by the size of joint desired. Each band end is then folded back upon itself into hook-shape as seen in Figure 2. This folding is not a sharp bending of the band as this would tend to weaken the band at the bend. On the contrary the ends are folded in such manner that a distinct cross-wise loop a^3 — a^4 is formed at each end. The hooked-ends are then engaged as seen in Figure 3 with the folded-over portion of one end extended between the folded portion of the other and the other band.

The seal C of the invention is an extremely simple one, and may be formed from a piece of the band material. It is simply bent to form two depending flanges C^2 and C^3 which as seen in Figure 4 are each at an obtuse angle to the plate portion C^1 . In Figure 5 the seal is shown with one flange $C^{2'}$ bent somewhat under the plate portion. The bottom edge C^4 of each flange portion is turned inward slightly so that when the flange is finally pressed against the under or inner surface of the band, these turned-in edges will lie snugly against said surface. The plate portion C^1 between the flanges is as wide as the band, and in the other direction is as long as the distance between the loops a^3 and a^4 when the band ends are together as in Figure 6.

The seal C of Figure 4 is applied to the interlocked band ends by merely placing it thereover, the space between the turned in edges C^4 being as great as the band in width. When a seal like that shown in Figure 5 is used, the bent-under flange $C^{2'}$ is first applied to one edge of the interlocked band ends and then, with this edge resting in the crotch of the flange, the seal is turned downward toward the band until the plate portion C^1 rests on the top layer of band ends and the flange C^3 extends down by the opposite edge of the interlocked ends. When thus positioned, pressure is applied to the plate portion to squeeze the interlocked ends tightly together and the flanges C^2 and C^3 , or $C^{2'}$ and C^3 are then bent inwardly and upwardly against the outerlocked ends with some constrictive pressure at their edges to seal the interlocked ends firmly together. Preferably at the same time pressure is also imposed upon the band to bend the upper layer around the loop a^4 so as to take the shape seen at a^5 in Figures 6 and 7. Similarly the lower layer is bent upward about the loop a^3 as at a^6 in Figures 6 and 7.

The bending of the band about the loop a^4 is to protect the edge of the seal against anything catching upon it, it being evident that anything sliding along the band, as from the left in Figure 6 will be deflected by the bend a^5 so as to pass easily over the joint. Likewise anything sliding along the band as from the right in Figure 6 will be similarly deflected by the band and loop a^3 so as to pass

over the seal and not disturb the joint. Thus the seal is protected by the loops a^3 and a^4 together with the bends a^5 and a^6 in the band, the latter as it were being somewhat defined by the shape of the loops.

The bends a^5 and a^6 in the band also serve another purpose, for they enable the band to give slightly in case of any inadvertent pull upon it and thus cushion the direct pull upon the joint. The yielding action of the bends a^5 and a^6 is also to a degree augmented by the slight yielding of the loops a^4 and a^3 if necessary, so that before the force of any unexpected pull is transmitted to the seal it will have been materially absorbed. Thus very little strain is placed upon the seal under the worst conditions and under normal conditions it has to resist only a very slight component of the pull on the band, being that tendency of the interlocked ends to swing open. This at most is small as the greater part of the pull of one band end is counterbalanced by the pull of the other band end. Since the seal is nested between the loops and bends of the band ends, it can not itself slide out of position, and, as before stated, is protected against being struck and moved by anything coming in contact with the package.

It is to be noted that the method of interlocking and sealing the band ends according to this invention, in no way weakens the tensile strength of the band ends but leaves them at full strength. In the drawings, for clearness, the thickness of the band and the joint are somewhat exaggerated and yet even as drawn, the characteristic feature of the thin flat joint is appreciated.

I claim:

1. The method of fastening a band about a bale or the like which comprises placing the band about the bale with its ends overlapping; bending each end into hook-shape with the bend extending outside of the plane of the band; interlocking said hooked-shape ends together; placing over said interlocked end a seal with its flat top plate portion between the respective bends of the band ends, and with its depending flanges extending beside the hooked ends; followed by the pressing of said flanges under the hooked ends to clamp said ends together.

2. The method of fastening a band about a bale or the like which comprises placing the band about the bale with its ends overlapping; bending each band end back upon itself so as to form a transverse crest across each band at the place of bending with the crest of greater thickness than the thickness of the band; interlocking said bent ends together; and placing a seal about said ends between the said crests to bind said band ends together.

3. The method of fastening a band about a bale or the like which comprises placing

the band about the bale with its ends overlapping; bending each band end back upon itself so as to form a transverse outstanding crest across each band at the place of bending; interlocking said bent ends together; and placing a seal about said ends between the said crests to bind said band ends together; and then deforming each band end adjacent the bend of the other band end to conform to the shape of said bends.

4. The method of fastening a band about a bale or the like which comprises placing the band about the bale with its ends overlapping; bending the end of each band end back upon itself by a rolled bend to form a transverse loop which upstands from the plain of the band; interlocking said bent ends together; and placing a seal transversely about the interlocked ends with its upper surface substantially in the plain defined by the tops of said loops.

5. The combination with a band having its ends bent into hook-shape and hooked together, of a seal having a plate portion adapted to lie across said hooked ends between the respective bends thereof, and having depending flanges adapted to be wrapped about the edges of said hooked-ends with constrictive effect to hold them together.

6. A band for a bale or the like having each of its ends bent back upon itself to form a hook, with the bend of each end constituting a transverse ridge across the band; and a seal adapted to be bent transversely around said ends when the latter are hooked together; the said seal lying between the said ridges and being thereby protected against displacement.

7. A band for a bale or the like comprising a hook shaped portion at each end engaging one another and with the bend of each hook upstanding above the plane of the band; and a seal having a plate portion nesting between said upstanding bends and extending across the band and having flange portions wrapped around the side edges of said hook-shaped portions and partly underlying them.

8. A band for a bale or the like comprising a hook shaped portion at each end engaging one another and with the bend of each hook upstanding above the plane of the band; and a seal having a plate portion nesting between said upstanding bends and extending across the band and having flange portions wrapped around the side edges of said hook-shaped portions and partly underlying them; each band being further bent to follow the configuration of the upstanding bend of the other so as to constitute a shield for the seal.

9. A seal for interlocked band ends comprising a flat plate portion adapted to extend across the interlocked ends and two flange portions extending at obtuse angles to said plate portion and adapted to pass by the

edges of said interlocked ends as the seal is applied thereto and to be then bent under the said ends with constrictive pressure against the side edges thereof.

6 10. A seal for interlocked band ends comprising a flat plate portion adapted to extend across the interlocked ends; a flange depending from one edge of the plate portion, being bent thereunder so as to hook around the
10 edges of said interlocked ends when applied; a flange depending from the opposite edge of the plate portion at an angle thereto so as to pass by the edges of the interlocked ends as the seal is swung around the opposite edges
15 of the ends as an axis; both said flanges being adapted to be tucked under the interlocked ends to bind them together.

11. A seal for interlocking band ends comprising a flat plate portion adapted to extend across the interlocked ends having a
20 flange depending from opposite edges thereof at an obtuse angle thereto; the bottom edges of each flange being turned inward whereby upon the said flanges being bent toward the
25 bottom surface of said interlocked band ends, the said turned-in flange edges will be tight thereagainst.

Signed at Boston, Massachusetts, this 15th day of October, 1929.

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