April 14, 1959 A. T. KOEHLER ET AL 2,881,915

STRAPPING SEAL AND PACKAGE THEREFOR

Filed Dec. 3, 1956 2 Sheets-Sheet 1

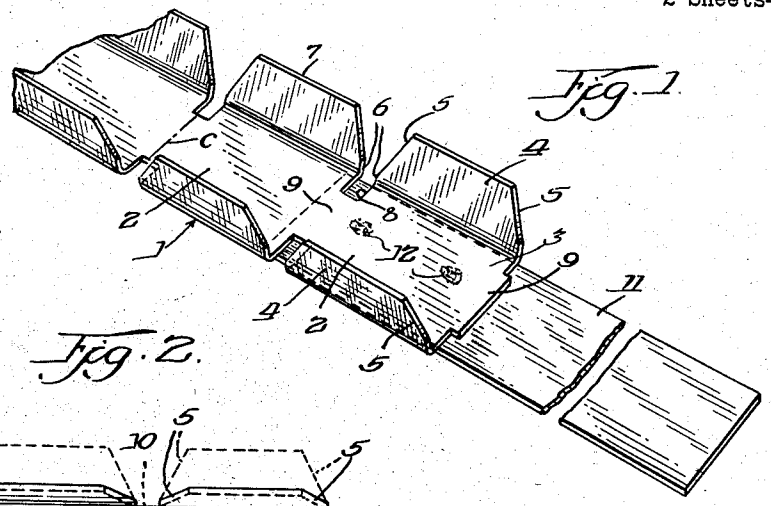


Fig. 1.

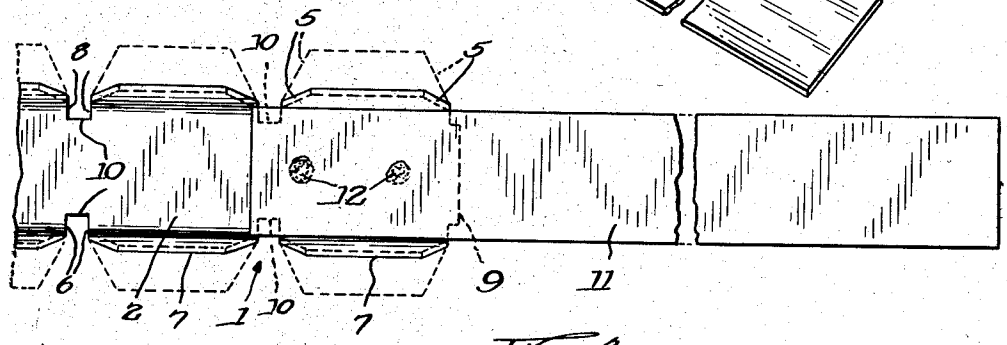


Fig. 2.

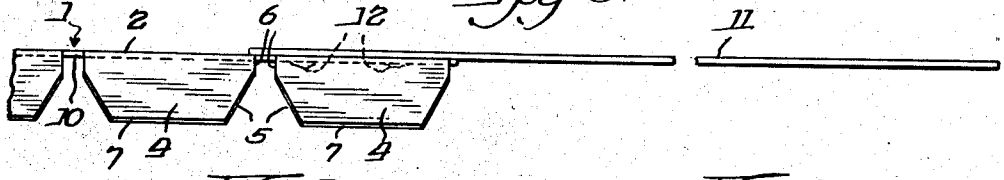


Fig. 3.

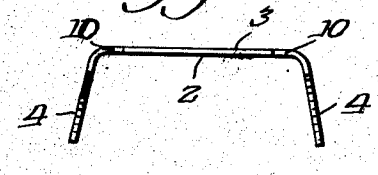


Fig. 4.

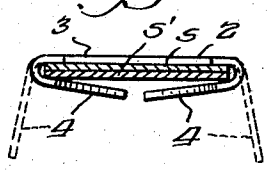


Fig. 5.

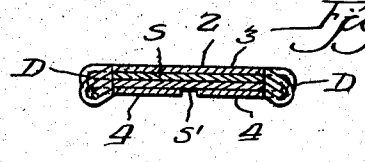


Fig. 6.

Inventors.
Albert T. Koehler,
Herbert Palmleaf, &
Melvin E. Ross.

By Lee & Lee Attys.

April 14, 1959 A. T. KOEHLER ET AL 2,881,915

STRAPPING SEAL AND PACKAGE THEREFOR

Filed Dec. 3, 1956 2 Sheets-Sheet 2

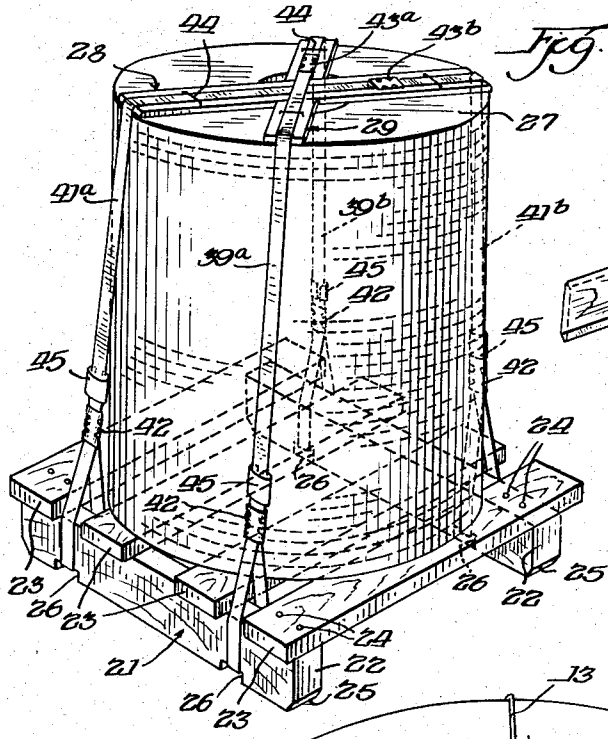


Fig. 9.

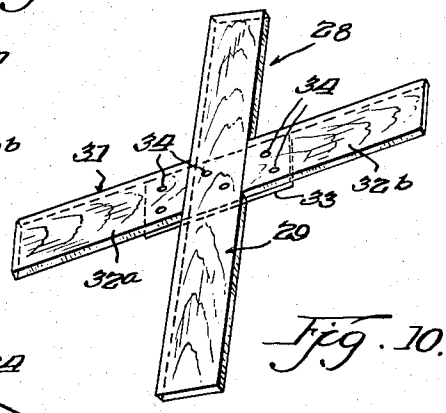


Fig. 10.

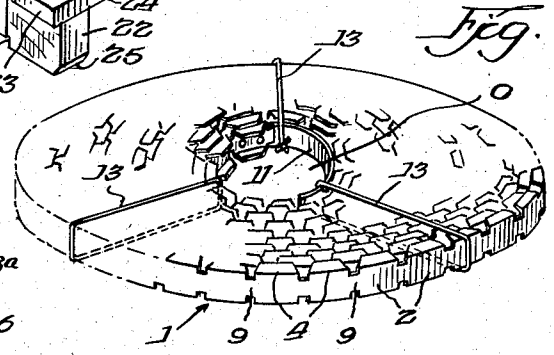


Fig. 7.

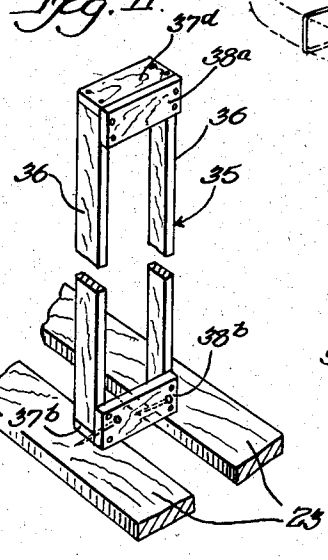


Fig. 11.

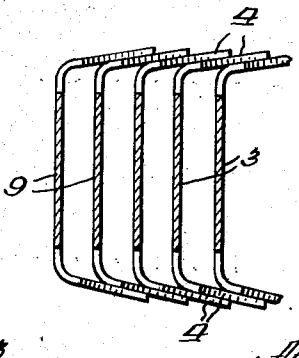


Fig. 8.

Inventors.
Albert T. Koehler,
Herbert Palmleaf, 6.
Melvin E. Ross.

By Lee & Lee Attys.

United States Patent Office 2,881,915
Patented Apr. 14, 1959

2,881,915

STRAPPING SEAL AND PACKAGE THEREFOR

Albert T. Koehler, Monticello, Ind., and Herbert Palmleaf and Melvin E. Ross, Park Ridge, Ill., assignors to A. J. Gerrard & Company, Melrose Park, Ill., a corporation of Illinois

Application December 3, 1956, Serial No. 625,845

5 Claims. (Cl. 206—65)

The invention relates generally to seals of the type used to bind two ends of a steel strap, and more particularly to a novel seal and package therefor.

The invention has particular application in connection with seals adapted to be utilized in automatic or semi-automatic machines wherein the seal is fed from a continuous strip or roll of seals and individual seals severed prior to crimping in the crimping machine.

The invention has among its objects the production of a seal which readily adapts itself for use in a continuous strip form and readily coiled for packaging purposes, etc., and which may be severed from succeeding seals without the formation of burrs and the like at the severed edges of the seal to eliminate danger of injury to persons in the application of the seal and the handling of the material to which the seal is applied.

Another object of the invention is the production of a strip of seals, which is provided at the trailing end of the strip with novel means for rendering automatic mechanism inoperative to feed the last seal, preventing possible damage to the machine, and providing an indication to the operator or attendant that the end of the strip has been reached, with such means also facilitating removal of the last seal from the machine prior to the insertion of a new strip of seals.

A further object of the invention is the production of a seal which not only provides a very effective fastening means, but also readily adapts itself to coiling, the angle of portions of the seal relative to the body of the seal being such that the strip of seals may be coiled with preceding seals on the strip nesting in succeeding seals, the amount of nesting being such that a relatively firm coil is formed, at the same time permitting the seals to be easily unwound from the coil without any wedging action, etc., which might impair the proper feeding of the seals.

A further object of the invention is the production of a novel package for seals of the type here involved wherein coils of seals in strip form may be readily stacked and packaged for transportation, etc., eliminating any danger of damage to the packaged seals under normal conditions. In the particular embodiment of the invention illustrated, the seals are shown in coils which in practice normally contain two thousand individual seals, the completed package containing twenty-five coils or a total of fifty-thousand seals.

A further object of the invention is the production of such a package of seals, which may be provided with means for retaining the package in fixed relation relative to a freight car or other container or object.

Many other objects and advantages of the present invention will be obvious to those skilled in the art from the disclosure herein given.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a perspective view of an end of a strip of seals embodying the present invention, illustrating the end member at the inner end of the strip prior to coiling;

Fig. 2 is a top plan view of the strip end illustrated in Fig. 1;

Fig. 3 is a side elevational view of such an end, the strip being inverted to that illustrated in Fig. 1;

Fig. 4 is an end elevational view of an inverted severed seal;

Fig. 5 is a view similar to Fig. 4, illustrating the seal in partially folded position about a pair of straps;

Fig. 6 is a sectional view through a seal crimp on such a pair of straps;

Fig. 7 is a perspective view of a coil of seals;

Fig. 8 is an approximate radial sectional view through a portion of a coil such as that illustrated in Fig. 7;

Fig. 9 is a perspective view of a completed package of a plurality of coils of seals such as that illustrated in Fig. 7;

Fig. 10 is a perspective view of the top cross member utilized in the package illustrated in Fig. 9; and

Fig. 11 is a perspective view of the core insert utilized in the package illustrated in Fig. 9.

Referring to the drawings, and more particularly to Figs. 1 through 6, the reference numeral **1** indicates generally a strip of interconnected strap seals **2**, only the last two seals of the strip being illustrated in Fig. 1. Each seal **2** comprises a body or base portion **3** and a pair of longitudinally extending opposed wing portions or flanges **4** which extend outwardly from the plane of the body portion **3**, and as illustrated in Fig. 4, diverge from their connection with the body portion. Thus the seal is generally U-shaped in transverse cross section, the legs of the U diverging slightly. As will be apparent from a reference to Fig. 2, which illustrates in broken lines a plan development of the seal blank, the outer corner of the wings **4** may be diagonally cut as indicated at **5**, to eliminate sharp corners while the edge portions of the wings adjacent the body portion **3** may be provided with edge portions **6** extending substantially at right angles to the outer edges **7**, the edges **6** extending inwardly to form end edges **8** on the body portion and thereby define a connecting tab or strip **9** between each successive seal.

Thus the strip of seals may be formed from suitable strip material which is provided with oppositely disposed notches along each edge of the strip, each notch being defined by the diagonal edges **5**, the edges **6** and **8**, and the longitudinal extending edges **10** of the connecting tab or strip **9**, following which the flanges or wings **4** may be bent into the desired positions, such as illustrated in Fig. 4.

The strip of seals is particularly adapted for employment in automatic or semi-automatic crimping mechanisms, wherein the strip is automatically advanced to position the lead seal within the crimping jaws of the mechanism, following which the wings **4** may be initially bent over and in effect wrapped around two sections of strap such as the straps S and S′ as illustrated in Fig. 5, following which the wings may be brought into strap gripping position and a plurality of deformations or crimps formed in the edge portions of the seal and the straps S and S′ to interlock the same in the usual manner commonly employed in the strapping field. Fig. 6 illustrates a cross sectional view of the strap and seal at one of such crimps or deformations.

It will be appreciated that the shape of the notches formed by the end edges **8** of adjacent seals and intermediate portion **9** provides a convenient point of engagement for means for successively advancing the seals into the crimping mechanism. It will be particularly noted that the length of the edges **10** provide adequate material in the connecting tab or strip **9** to insure severing of the seals thereat and eliminate any possibility of the formation of a burr or the like. It will be appreciated

however, that if the last seal were permitted to be fed through the machine, it might be possible to shear a slight strip from the extreme end portion **9** on the last seal, if the overall length of the seal body, including the portion **9**, happened to be slightly longer than the length to which the individual seal is normally cut at the time of severage from the strip, thus forming a sliver of metal which might drop into the mechanism and jam the same. To eliminate any possibility of this happening, a flat strip **11** may be attached to the last seal, the strip being of approximately the same width as the body portion **3** and extending forward to the next to the last seal to bridge the slots therebetween at the connecting portion **9**, and in effect closing such slots. Thus when the next to the last seal is reached, as the slots are bridged by the strip **11**, so that the advancing mechanism cannot engage the edge **8** of the next to the last seal, resulting in failure to feed the last two seals and rendering the mechanism inoperative to indicate to the operator that the end of the strip has been reached. The length of the strip **11** preferably is such that it may be conveniently grasped by the operator to permit withdrawal of the last two seals from the machine. Strip **11** may be secured to the strip of seals by any suitable means, as for example, spot welding **12**.

In manufacturing the seals, which may be by any convenient method, as for example, by suitable punch press operations, the strip **11** may be initially secured to the lead end of the strip as it comes from the forming mechanism, following which the strip may be coiled, positioning the strip **11** at the inner end of the coil, as clearly illustrated in Fig. 7. When the coil has reached the desired size it may be severed from the following portion of the strip and suitably tied by a plurality of ties **13**, which, for example, may be wire ties, the latter being more or less uniformly spaced about the periphery of the coil. Such a bound coil is illustrated in Fig. 7, and has a central opening O therein through which the ties may pass. The smallest loop of seals at the center of the coil is of such size that the seals are not unduly bent at the portions **9**, permitting the coil to ultimately be uncoiled into a substantially straight position without introducing bends or kinks therein. While the amount of nesting between convolutions of the coils may vary, particularly with the seal size, we prefer to have the seals, especially the larger seals, partially nest as illustrated in Fig. 8, forming a relatively firm coil, and at the same time eliminating any danger of a wedging of one convolution within the other. Obviously, if the nesting is loose, the resulting coil will not be firm and thus could be subject to damage and the like. On the other hand, if the nesting angle is too small, there may be a strong tendency of one convolution to wedge in the other, impairing the efficiency of the machine in which the seals are utilized.

It will be appreciated that coils of the type here involved may be easily damaged during handling and transit, irrespective of the efficiency of the coiling operation, and to insure handling and transit of such coils, particularly in comparatively large quantities, a novel packaging arrangement has been devised which will eliminate any possibility of damage under any normal conditions.

Figs. 9, 10 and 11 disclose such a package, that illustrated readily accommodating twenty-five coils, such as that shown in Fig. 7, which on a basis of two thousand seals to a coil would total fifty thousand seals to the package.

As illustrated in Fig. 9, the coils of seals, indicated by dotted lines, are adapted to be positioned in vertical axial alignment on a skid, indicated generally by the numeral **21**, comprising a pair of relatively heavy substantially parallel side members **22** connected by a plurality of lighter cross members **23**, which as illustrated may be suitably spaced to reduce the quantity of stock to a minimum, and at the same time provide adequate support for the stack of seal coils. The members **22** and **23** may be suitably fastened together, as for example, by nails **24** or the like, forming a rigid structure and, as illustrated, the longitudinal members **22** may be provided with chamfered corners **25** and transversely extending notches **26**.

After the stack of coils has been placed on the skid **21** it may be shrouded with a suitable covering **27** of paper or the like and positioned on the top of the stack, may be an upper member indicated generally by the numeral **28**, which as illustrated in Fig. 10, is substantially X-shaped, having intersecting members **29** and **31**. The member **31** may, for example, be formed in two sections **32***a* and **32***b* positioned in abutting relation with the member **29** and rigidly secured thereto by a cleat member **33** located at the bottom side of the member **28** and underlying the adjacent portions of the latter and the members **32***a* and **32***b*, the assembly being secured in rigid relation by suitable means such as nails **34**. The cleat member **33** is of a length approximately equal to or slightly less than the inner diameter of the coil so that the member **33** may be positioned in the opening O in the uppermost coil, accurately centering the member on the top of the stack.

To prevent lateral shifting of one coil relative to another or to the skid **21**, as well as provide a bearing for the cross member, a core insert indicated generally by the numeral **35** may be located within the stack on the longitudinal axis thereof, the member **35**, for example, comprising a pair of spaced, substantially parallel side members **36** connected at their ends by cross members **37***a* and **37***b*, and reinforcing members **38***a* and **38***b* at the sides of the structure. The various components of the core structure may be fastened together by suitable means such as nails or the like, the size of the core member **35** being such that the height thereof is slightly less than the height of the stack, by approximately the thickness of the cleat member **33** on the upper member **28** and the transverse dimensions are such that it may be more or less snugly received in the central bore of the stack formed by the central openings O in the coils, thereby anchoring the coils with respect to lateral movement. The core member **35** preferably is suitably attached, as for example by nailing, to the cross members **23** of the skid **21**, prior to the stacking of the coils, thus forming a rigid assembly upon which the coils may be stacked with the core member forming aligning means for the respective coils during the stacking operation.

Referring to Figs. 9 and 10, it will be noted that the cross members **29** and **31** of the upper member **28** do not extend at right angles with respect to one another, but at such an angle that the outer ends of the members are substantially in alignment with the portions of the members **22** of the skid adjacent the notches **26**.

Looped about the members **22** adjacent each notch **26** are strap sections **39***a*, **39***b*, **41***a* and **41***b*, the sections **39***a* and **39***b* being more or less diametrically positioned with respect to the stack, and in adjacent diagonally opposite corners of the skid, in like manner the sections **41***a* and **41***b* may be positioned adjacent the other diagonally opposite corners of the skid, each strap having one end portion looped about the adjacent member **22**, with the strap engaged in the adjacent notch **26** and the free ends of each loop connected together by suitable means such as a crimped seal **42**. Each strap is of a length to extend upwardly to the adjacent leg portion of the upper member **28** and the diametrically opposite straps may be connected at their free ends by respective seals **43***a* and **43***b*, each pair of joined straps being suitably tensioned prior to the sealing operation. The straps may be suitably anchored to the respective leg on which they are positioned by means such as staples **44** or the like, thereby

preventing disengagement of the straps from the upper member.

As will be apparent from Fig. 9, the length of the arms or legs **29** and **31** of the upper member **28** and the transverse dimensions of the skid **21** are each sufficiently greater than the diameter of the seal coils, to provide adequate protection to the stack at all times.

To facilitate anchoring of the skid and thus the stack in a railway car or other conveyance or container, loose sealing clips **45** may be positioned on each strap section **39***a* and **39***b* and **41***a* and **41***b*, by means of which an anchoring or retaining strap may be connected to the stack retaining straps **39** or **41** and secured thereby by crimping the seal **45** on the overlapped straps.

It will be apparent from the above description that we have provided a simple but yet effective coil of seals and novel means for packaging the same to insure safe transportation and handling thereof.

Having thus described our invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of our invention; hence we do not wish to be understood as limiting ourselves to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

We claim:

1. In a strapping seal for use in coil form in automatic sealing mechanisms, the combination of a body member formed from strip material having a pair of wing portions extending outwardly from the longitudinal edges of the body portion in diverging directions at substantially equal angles with respect to the body portion, the angle of divergence being sufficient to permit partial nesting of one seal within another but insufficient to permit a complete nesting thereof, said body portion having its respective end edge portions adjacent said wings extending at right angles to the longitudinal axis of the seal, said wings having diagonally extending edges at the outer corners thereof, said seals being formed in a series on a common longitudinal axis interconnected by respective connecting portions of a transverse width less than that of the body portion and having longitudinally extending side edges which are parallel to the said longitudinal axis, the strip of seals being coiled with the respective seal axes being positioned in spiral relation, the seal wings extending radially inward with the seals of one convolution partially nested in the seals of the adjacent convolutions and a flat strip secured to the inner end of the coil, and bridging adjacent end edges of the body portions of the last and next to the last seals of the coil.

2. In a strapping seal for use in coil form in automatic sealing mechanisms, the combination of a body member formed from sheet material having a pair of wing portions extending outwardly from the longitudinal edges of the body portion in diverging directions at substantially equal angles with respect to the body portion, the angle of divergence being sufficient to permit partial nesting of one seal within another but insufficient to permit a complete nesting thereof, said body portion having its respective end edge portions adjacent said wings extending at right angles to the longitudinal axis of the seal, said wings having diagonally extending edges at the outer corners thereof, said seals being formed in a series on a common longitudinal axis interconnected by respective connecting portions of a transverse width less than that of the body portion and having longitudinally extending side edges which are parallel to the said longitudinal axis, the strip of seals being coiled with the respective seal axes being positioned in spiral relation, the seal wings extending radially inward with the seals of one convolution partially nesting in the seals of the adjacent convolutions and a piece of flat stripping secured to the inner end of the coil, said strip being of approximately the same width as that of the seal body and extending to the next to the last seal to operatively cover the connecting portions between the last and next to the last seals operative to prevent feeding thereof as the end of the coil is approached, such strip being of a length to extend from the sealing mechanism and facilitate removal of the coil end from the machine.

3. A strap seal package comprising a skid of a size to receive a stack of coils of strap seals, each having a central opening therein and comprising a plurality of seals formed from a continuous strip of material, each seal comprising a body portion and oppositely disposed, longitudinally extending wing portions, successive seals having integrally connected body portions to form a strip of connected seals, the strips being coiled with the wings generally extending radially inward and the seals of a preceding convolution being at least partially nested in the next convolution whereby a relative firm coil results, and a length of strap having a width approximately that of the body portions secured to the inner end of the coil and extending to the second seal at such end, the coils being vertically stacked upon the skid in axial alignment, the transverse dimensions of the skid being greater than the external diameter of the coils, an axially extending insert positioned in the central openings in the coils for restricting lateral movement of one coil relative to another, an X-shaped member positioned on the uppermost coil with the leg portions extending outwardly beyond the peripheral edge of the coil, said member having an extension positioned in the central opening of the top coil to restrict lateral movement therebetween, strapping extending from the skid to each leg portion and over the same to retain the coils in position on the skid, and an uncrimped seal on each strap portion for subsequent connection to skid retaining straps in a transportation container.

4. A strap seal package comprising a skid of a size to receive a stack of coils of strap seals, each having a central opening therein and comprising a plurality of seals formed from a continuous strip of material, each seal comprising a body portion and oppositely disposed wing portions extending outwardly from said body portion in diverging directions, successive seals having their body portions connected by integral portions of uniform width less than the width of the body portions to form a strip of connected seals, the strip being coiled with the wings generally extending radially inward and the seals of a preceding convolution being at least partially nested in the next convolution whereby a relatively firm coil results, and a length of strap having a width approximately that of the body portions secured to the inner end of the coil and extending to the second seal at such end to bridge the connecting portion between the last two seals, the coils being vertically stacked upon the skid in axial alignment, the transverse dimensions of the skid being greater than the external diameter of the coils, an axially extending insert positioned in the central openings in the coils for restricting lateral movement of one coil relative to another, a paper shroud covering the stack, an X-shaped member positioned on the covered uppermost coil with the leg portions extending outwardly beyond the peripheral edge of the coil, said member having an extension positioned in the central opening of the top coil to restrict lateral movement therebetween, strapping extending from the skid to each leg portion and over the same to retain the coils in position of the skid, and an uncrimped seal on each strap portion for subsequent connection to skid retaining straps in a transportation container.

5. In a strapping seal for use in coil form in automatic sealing mechanisms, the combination of a body member formed from strip material having a pair of wing portions extending outwardly from the longitudinal edges of the body portion in diverging directions at substantially equal angles with respect to the body portion, the angle of divergence being sufficient to permit partial nesting of one seal within another but insufficient to permit a complete nesting thereof, said body portion having its respective

end edge portions adjacent said wings extending at right angles to the longitudinal axis of the seal, said seals being formed in a series on a common longitudinal axis interconnected by respective connecting portions of a transverse width less than that of the body portion and having longitudinally extending side edges which are parallel to the said longitudinal axis, the strip of seals being coiled with the respective seal axes being positioned in spiral relation, the seal wings extending radially inward with the seals of one convolution partially nested in the seals of the adjacent convolutions and a flat strip secured to the inner end of the coil, and bridging adjacent end edges

of the body portions of the last and next to the last seals of the coil.

References Cited in the file of this patent

UNITED STATES PATENTS

779,915	Doane	Jan. 10, 1905
1,444,103	Boyd	Feb. 6, 1923
1,474,207	Payne	Nov. 13, 1923
1,939,631	Randall	Dec. 12, 1933
2,062,099	MacChesney	Nov. 24, 1936
2,160,235	Slusar	May 30, 1939
2,691,198	Flood	Oct. 12, 1954