Jan. 15, 1963 D. B. SYMMONDS, JR 3,073,439

CORNER PROTECTOR

Filed Nov. 30, 1959

Fig. 1.

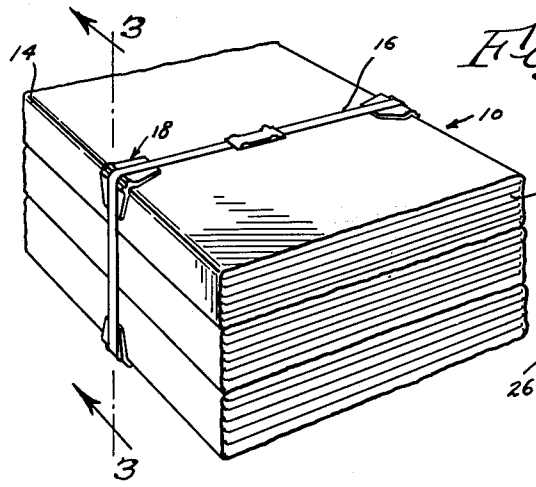


Fig. 2.

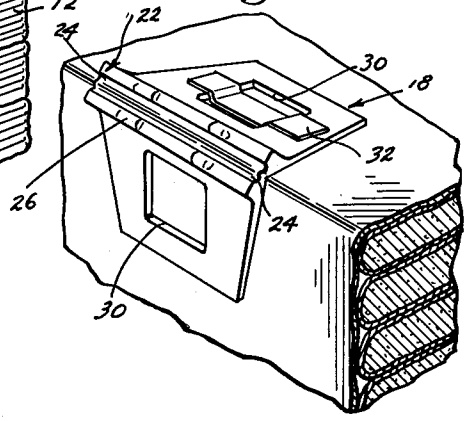


Fig. 3.

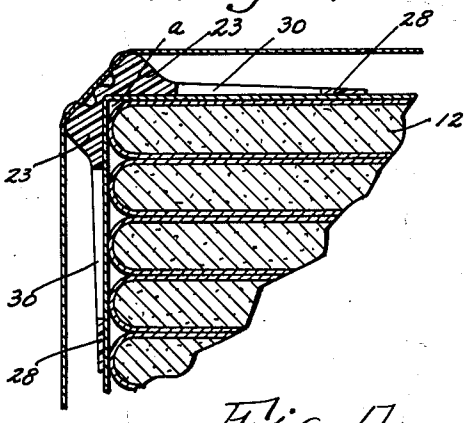


Fig. 5.

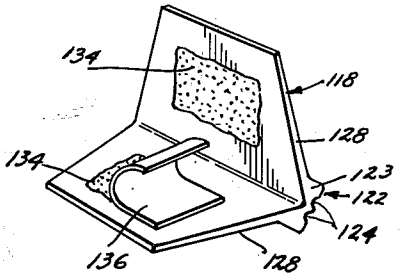
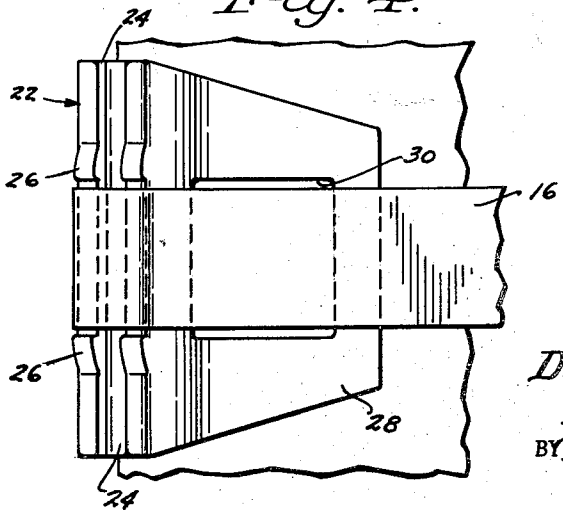


Fig. 4.



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CORNER PROTECTOR

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This invention relates to the art of packaging and bundling, and more particularly to a novel corner protector which effectively prevents damage to the corners of packages and bundles held together by metal bands for shipment and handling.

Heretofore in the art it has been customary to form corner protectors from sheet metal wherein the proper form of protector was stamped out of stock into the desired shape. One of the major drawbacks to protectors of this type was caused by the impossibility of obtaining a sharp inside corner due to the fact that the metal would crack, and render the protector useless. Therefore, in metal protectors there never could be a snug fit over the corner of the package or bundle it was supposed to protect, and damage would result, both when the tensioned band or strap was applied over the corner, and in the actual handling of such packages or bundles during shipment.

In corner protectors made in accordance with the invention, the above referred to disadvantages are completely avoided. This is because my novel corner protector has a sharp angular inside corner which enables it at all times when in use to fit snugly over the corner it is to protect, and also to insure that the opposed arms thereof lie flat against the goods in the bundle.

In accordance with the invention my novel corner protector preferably is formed of a flexible plastic material which has sufficient resiliency that when in use it can adapt itself to the sides of the bundle or package it protects, as mentioned above. I have found that polyethylene and polypropylene give satisfactory results. If desired, other suitable plastic materials, or combinations thereof with foil, sheet material other than relatively thick sheet metal, can be used, so long as they can be formed in such manner as to provide a sharp inside corner angle which enables the corner protector thus formed to fit snugly against the corner of the goods it protects.

It is, therefore, an object of the invention to provide a novel corner protector which is so constructed that it practically eliminates the danger of damage to packages and bundles on which it is used.

It is a further object of the invention to provide a novel, rust-proof corner protector so constructed that it fits snugly against the corner of a package or bundle to be banded or stripped for handling and shipment, and wherein the inside corner of the protector is angular in such manner that when held by a suitable banding strip in operative position on a bundle or package the seated relationship of the protector thereon is such that danger of damage to the corner of the bundle or package covered thereby is practically eliminated.

It is a further object of the invention to provide a novel plastic corner protector which is effective in preventing damage to packages and bundles on which it is used. The invention further is characterized by the provision of means associated with the protector for securing it in a preselected position on the corner of a bundle or package, thereby making it an easy matter to apply a metal band or other suitable securing strip around the bundle or package and over the corner protectors.

The invention is further characterized by the provision of a plastic corner protector formed from polyethylene or polypropylene or other suitable plastic wherein the

inner faces of the arms lie in planes intersecting in a sharp angle so that the protector when placed in operative position on the corner of a bundle being banded fits snugly on the corner and the inner faces of the opposed arms lie flat against the goods being bundled.

The invention also consists in the provision of a novel corner protector having means for maintaining it in a selected position on the corner of a package so that the required number of corner protectors can be assembled around the package and then the required banding strip, or band can be wound over the corner protectors and secured in tension about the package.

The invention is further characterized by the provision of a novel corner protector formed from a non-metallic material, and wherein the inner faces of the opposed arms are disposed in such angular arrangement that when the protector is placed on a package and covers a portion of the corner thereof the sides lie flat against the package sides with the inside corner snug against the corner portion it covers. In this way no damage can be inflicted to the corner portion which is protected despite the fact that the protectors are held against the package by a banding strip under tension.

It is a further object of the invention to provide a novel corner protector for packages and bundles wherein there is formed on the rear portion of the protector over which the securing strip is disposed a relatively wide ridge which is operative to spread the pressure load imposed by the tensioned strip over a broad area, thereby aiding in the prevention of damage to the contents of the package or bundle.

An additional object of the invention is the provision of a novel corner protector having means for spreading the pressure load applied by a tensioned metal banding strip or other suitable strip over a relatively large area of the goods thus banded and wherein the band or strip at all times is maintained out of contact with the goods.

With these and other objects not specifically mentioned in view, the invention consists in certain combinations and constructions which will be described fully hereinafter, and then set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same or like parts:

FIGURE 1 is a perspective view of a bundle or package tied with a suitable band or strip using four corner protectors constructed in accordance with the invention;

FIGURE 2 is a perspective view of a preferred embodiment of my novel corner protector;

FIGURE 3 is a sectional view taken on line 3—3 in FIGURE 1;

FIGURE 4 is a plan view of the structure shown in FIGURE 3; and

FIGURE 5 is a perspective view of a modified form of the invention.

Referring to the drawings, it will be seen that the corner protector forming the invention is generally L-shaped in appearance. Where the protector is to be used with bundles or packages having a square or rectangular cross-section, the angle between the arms is 90°. In the case where the protector is to be used with a hexagonal cross-section, the angle between the arms is 120°. It is evident that the angular relationship between the arms depends upon the cross-section of the goods being strapped.

The words "bundle" and "package" are used herein in their generic sense, and include all types of goods, such as single articles, such as doors, stacks of goods, and packages wherein tie straps or bands are used in preparing them for shipping and handling, and whether such articles and goods are wrapped or not.

FIGURE 1 discloses a completed bundle designated generally **10** comprising three superimposed wrapped stacks **12** of Sheetrock building material. Because of the nature of the goods thus prepared for shipment, it is important that in the strapping of the goods no damage be caused to the corner portions **14** where the straps or bands **16** are applied. In bundle **10**, four corner protectors **18** are secured by strap **16**, the latter having been tied under suitable tension by clamp **20** of conventional design using a conventional tool (not shown).

Referring to FIGURES 2 and 3, which show more in detail a preferred embodiment of corner protector **18**, it will be noted that it comprises an elongated body **22**, which if desired may be provided with longitudinal grooves **24**. These grooves afford a measure of flexibility to body **22** in a direction at right angles to its length when corner protector **18** is secured to the goods being bundled or packaged. Grooves **24** also effect a saving in the material from which protector **18** is formed. Longitudinally spaced lugs **26** formed on body **22** prevent band or strap slippage on a completed bundle **10**.

Extending outwardly from body **22** are two arms **28**. In the forms of the invention illustrated, arms **28** are substantially equal in length. It will be appreciated, however, that one arm **28** could be longer than the other, if desired. This would depend upon the size of the bundle being formed and its cross-section. Arms **28** are provided with openings **30**, of suitable shape. In FIGURES 2 and 3, these openings are substantially square in cross-section. The purpose of these openings is to make it possible to insure that once a corner protector **18** is placed in proper position on a bundle to be tied or strapped, it will remain there during the strapping or tying operation until the bundle is completed. This method avoids the necessity of nailing through the arms of a protector, which obviously damages a portion of the goods being packed, and at the same time it affords an extremely simple way of securing a protector in place for strapping. Nails, however, may still be used in bundling some types of goods, if desired, since they can be easily driven through the plastic without splitting it.

In FIGURE 2, a corner protector **18** has been placed on a bundle being strapped. By virtue of openings **30**, protector **18** is held in desired position by a strip of masking tape **32**. In FIGURE 2, only one opening **30** is used. It is obvious that both could be used, in which case the position on the bundle of protector **18** would be doubly assured. In experience, I have found that only one opening **30** need be used, and that because of simplicity in manufacture, and also to provide a choice of openings in actual use, it is a good idea to provide at least one opening **30** in each arm **28**. As shown, openings **30** are formed well within the central limits of arms **28**, and thus insure that they will be firmly and positively held in position prior to the attachment of banding strip or band **16** in forming a bundle **10**. Openings or holes **30** also effect a savings in material, since protectors **18** are molded plastic parts.

Referring again to FIGURE 3, it will be seen that lugs **28** centralize strap **16** on corner protectors **18**. The masking or other type of securing tape can be removed after strap **16** has been secured by clamp **20** (FIGURE 1) or, if desired, may remain on the final bundle. As shown in FIGURE 3, the outer edges of body **22** are so disposed with respect to the arms **28** that in its final operative position, strap **16** is maintained out of contact with the bundle.

My novel protector **18** is made of any suitable plastic. I have found that polyethylene and polypropylene, preferably of the high density types, which are relatively cheap, and easily fabricated give satisfactory results. Since plastic is rustproof, at no time will a package or bundle using my protector be spoiled by rust as is frequently the case in packages having metal protectors. Furthermore, my novel protectors are tough, resist breakage, and are substantially unaffected by normal changes in temperature, thereby contributing to a very good package. Furthermore, my novel protector cannot crack or split and cut the hands of those handling such packages, as is the case with protectors made from metal.

In accordance with my invention, it is possible to make a corner protector in which the inner faces of the arms extending outward from body **22** and which lie against the sides of the package lie in planes which intersect and form the desired sharp seating angle. For example, in corner protector **18** shown in the drawings, and especially in FIGURE 3, the angle *a* between arms **28** is 90°. There is no radius between the inside faces of arms **28** at their line of intersection forming angle *a*. If the package or bundle being formed was hexagonal in cross-section, then the angle formed by the intersection of the arms **28** would be 120°, as would be the case for an equilateral, triangular cross-section package. The important feature of this construction is that this accuracy in the angular relationship of arms **28** enables a protector **18** to fit or seat snugly against the corner of a package it is to protect. In this way, in the handling and/or shipping of a bundle or package to which it is applied, the corner protector cannot be damaged. It is noteworthy that the plastic material not only is tough and resistant to breakage, but also acts to absorb shocks and prevent them from reaching the goods protected. This feature is unknown in the case of metal protectors which can bend and be distorted by blows against them.

The forms of corner protectors **18** and **118** shown in the drawings have arms which may be termed trapezoidal in plan, see particularly FIGURE 4 and also FIGURE 5. While I have found that this shape gives most satisfactory results, other shapes could be used.

The construction shown in FIGURE 5 is essentially the same as that shown in FIGURES 1–4 inclusive, except for the means by which corner protector **118** is maintained on a bundle or package being strapped or tied. Therefore, no detailed description of its construction is considered necessary. Corner protector **118** which has an elongated body portion **122** having longitudinal grooves **124** and spaced lugs (not shown) corresponding to lugs **26** of the embodiment shown in FIGURES 1–4, is provided with a coating of a suitable adhesive, preferably a tacky adhesive **134**, normally covered by a protecting sheet **136**. As shown, there is a coating of adhesive **134** on the inner face of each of the arms **128**, although a satisfactory result would be obtained if only one inner face was coated. As mentioned, it is preferred to use a permanently tacky adhesive. A suitable adhesive of this type is a so-called pressure-sensitive adhesive such as made and sold by Minnesota Mining and Manufacturing Company, Minneapolis, Minnesota, under the designation No. 1383, No. 1431 and No. 1815. In preparing a corner protector **118** after it has been made, the desired amount of adhesive is applied to a selected portion of the inner face of an arm **128**, in a desired pattern, i.e., a rectangular coating **134**, although any other shape could be used. Over the coating **134** is applied a cover sheet **136** of glassine paper or thin plastic sheeting made from cellulose acetate or other suitable plastic. When the corner protector is to be used, sheet **136** is stripped from one or both inner faces of arms **128**, the protector **118** is pressed home against the portion of the corner of a bundle it is to protect, and after the required number of protectors have been applied around the bundle, a strap or band **16** is tied and fastened to complete the bundle **10**, as described hereinabove.

Referring again to the drawings, it should be noted that my novel corner protector comprises relatively rigid portions **23**, and **123**, respectively, on body **22**, and **122**, respectively, to which are joined as integral parts, arms **28** and **128**, respectively, the latter having faces which seat flat against the goods to be strapped or banded together.

As best shown in FIGURE 3, rigid portions **23** are projections forming integral parts of body portion **22**, and they extend rearwardly and laterally on body portion in such manner that when a strap or band **16** is passed thereover and secured and tensioned, the pressure of the strapping load exerted or imposed by the strap or band is directed wholly against the surfaces of the projections **23** which extend along apposite sides of body portion **22** with respect to a plane bisecting the corner angle *a* formed by the intersection of the inner faces of arms **28**. In this manner tensioned strap or band **16** does not exert any pressure or stress either on the corner of the protector between projections **23** or on the portion of the package it protects. Instead, the entire strapping load is spread over the sides of the package adjacent the portion where the protector is secured. The same conditions obtain for the modified form of protector **118** shown in FIGURE 5.

It will be seen, therefore, that the design and positioning of the elements of my novel protector, and the manner in which the inner faces of the arms thereof lie in planes intersecting to form a desired angle, as described, preclude the possibility of damage to merchandise being strapped or banded for shipment, handling and storage. Thus the invention makes possible the provision of a tough, shockproof and rugged protector not heretofore known or available in the art.

What I claim is:

1. A corner protector of the type described comprising a generally L-shaped elongated body having two angularly disposed outwardly extending arms formed integrally therewith, the inner faces of said arms lying in planes intersecting on one side of said body to form a relatively sharp inside corner angle adapted to be seated against a selected corner portion of a package to be strapped, strap supporting means formed integrally on the opposite sides of said body and extending in spaced substantially parallel relationship along opposite sides of the line bisecting the angle formed by the planes of intersection of said inner faces of said arms, said strap supporting means also extending rearwardly and laterally from said body to provide a support surface for a tensioned strap passed thereover and located above the corner portion of said body portion extending between said supporting means, and secured in such manner that the strapping band load is imposed only on said supporting means and is directed thereby over a substantial area of the sides of the package where said protector is secured by a strap.

2. The invention defined in claim 1 including openings formed in said arms of said protector for assisting in the securing of said protector to a package.

3. The invention defined in claim 1, wherein said supporting means comprise projections, and wherein the surface portions of said projections which support said strap are so located as to support the portion of a strap passing thereover in a plane substantially at right angles to the plane bisecting the angle formed by the intersecting inner faces of said arms, whereby to absorb the strapping load of said strap and direct it over a substantial area of the sides of a package.

4. A plastic corner protector of the class described comprising a body having a front portion formed by two integral outwardly extending arms having their inner faces lying in planes intersecting to form a relatively sharp corner angle adapted to seat against a selected corner of a package to be protected, said body also having a rear portion, a pair of spaced projections formed integrally with said rear portion of said body and extending outwardly and laterally therefrom to provide a strap supporting surface lying in a plane substantially at right angles with the plane passed through said corner angle and bisecting it, the edges of said projections being spaced above the center of the rear portion of said body, whereby that part of a tensioned strap passing over said strap supporting surface is so supported that the entire strapping load of said tensioned strap is spread over a substantial area of the sides of said package, and damage to the corner of said package beneath said protector is prevented.

5. The invention defined in claim 4 including lug means formed integrally on said projections, said lug means being so spaced as to prevent substantial lateral shifting of a tensioned strap passing over said surface of said projections.

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