Aug. 15, 1944. F. W. HUMPHNER 2,356,059

BINDING DEVICE AND MATERIAL THEREFOR

Filed Dec. 14, 1942

Fig. 1

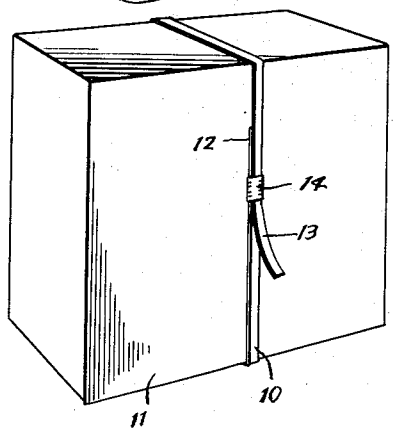


Fig. 2

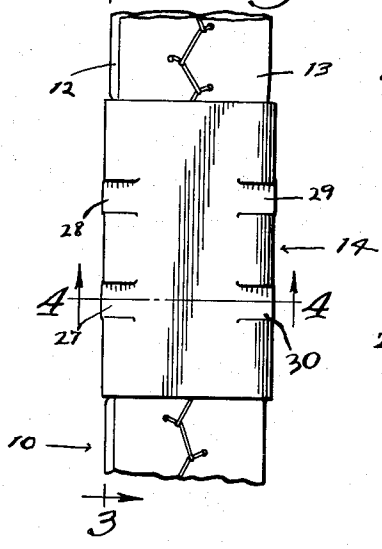


Fig. 3

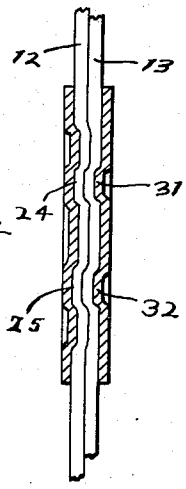


Fig. 4

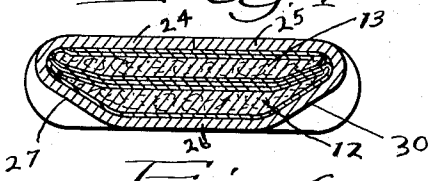


Fig. 5

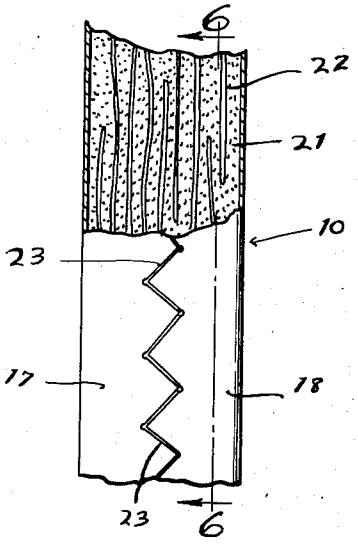
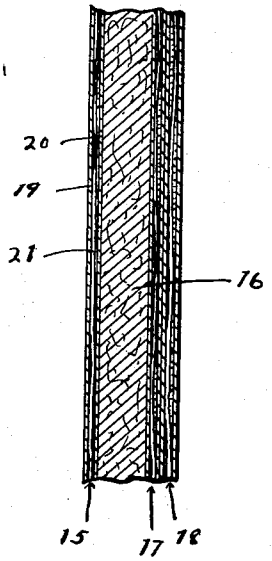


Fig. 6



Inventor:
Ferdinand W. Humphner,
By Dawson, Orris & Booth,
Attorneys.

Patented Aug. 15, 1944 2,356,059

UNITED STATES PATENT OFFICE

2,356,059

BINDING DEVICE AND MATERIAL THEREFOR

Ferdinand W. Humphner, River Forest, Ill., assignor to Mid-States Gummed Paper Co., Chicago, Ill., a corporation of Delaware

Application December 14, 1942, Serial No. 468,926

6 Claims. (Cl. 24—23)

This invention relates to a binding device and material therefor, and more particularly to a binding strap which may be used to bind bundles of objects together or to bind cartons, containers and the like.

An object of the invention is to provide a device for binding loose bundles of objects of materials, such, for example, as shell casings and the like, into a compact body and for supporting containers or cartons. Another object is to provide a device made primarily of non-critical material which is suitable as a substitute for steel strapping and the like. Yet another object is to provide a binding strap which is made essentially of paper. A further object is to provide a device which is easy to handle and which is free of any sharp or cutting edges.

Another object of the invention is to provide a binding strap which is resistant to water and which possesses a minimum of elasticity. Yet another object is to provide a binding strap which is flexible so as to tightly engage the materials to be bound and which at the same time possesses sufficient rigidity to permit the strap to be secured in place with a conventional clamp. A further object is to provide a binding strap of paper tape or the like, including means for reinforcing the tape and for stiffening the tape to provide the desired rigidity therein.

Other features and advantages of the invention will appear from the following specification and drawing, in which—

Fig. 1 is a perspective view of a carton supported by the binding device of the invention; Fig. 2 is a fragmentary detail elevational view showing a clamp applied to the binding strap; Fig. 3 is a longitudinal sectional view taken along the line 3—3 of Fig. 2; Fig. 4 is a transverse sectional view taken along the line 4—4 of Fig. 2; Fig. 5 is a front elevational view partly broken away, showing the construction of the binding strap; and Fig. 6 is a longitudinal sectional view taken along the line 6—6 of Fig. 5.

Ordinary paper tape is not suitable as a substitute for steel strapping in binding cartons, containers and the like, not only because the tape is not sufficiently strong but also because the paper tape is normally so flexible that the conventional clamp cannot be securely attached to it. On the other hand, if the paper is sufficiently rigid to permit attachment of the clamp, then it is not flexible or tough enough to withstand the strains to which it is subjected. In a binding strap, great strength and toughness are necessary. The present invention contemplates a binding strap made essentially of paper which is tough, strong and flexible, and which at the same time possesses sufficient rigidity to permit the secure attachment thereto of a conventional binding clamp. In addition, the strap may be substantially water-resistant and may possess a minimum of elasticity.

In the embodiment of the invention described herein, a strap 10 may be placed about a container 11 with the end portions 12 and 13 of the strap in overlapping relation. A suitable clamp 14 may be applied to the overlapping ends of the strap to secure the strap in position. The longitudinal folds in the tape as illustrated may extend throughout substantially the entire length thereof.

As seen particularly in Figs. 5 and 6, the binding strap may be formed of a layer of paper tape 15 wrapped or wound about a strip 16 of stiffening material, such as cardboard, paperboard, chipboard, wood veneer, or the like. Preferably, the tape is folded longitudinally about the edges of the paperboard strip 16 and the lateral edge portions 17 and 18 of the tape may then be folded over each other in overlapping relation to enclose the paperboard strip 16.

Any suitable type of tape may be used for this purpose. Preferably, as shown, the tape includes a pair of sheets of paper 19 and 20, with an adhesive material 21 carrying reinforcing fibers 22 interposed between the two layers of paper. The adhesive material may be asphalt or other suitable material and may thus serve the function of increasing the moisture resistance of the tape as well as securing the reinforcing fibers 22 in position. Preferably, the reinforcing fibers are longitudinally disposed with respect to the tape, as shown in Fig. 5.

The paper sheets 19 and 20 may be of any suitable type and are preferably a high wet strength kraft paper which will prevent scuffing of the paper when wet.

The reinforcing fibers 22 may be of sisal or of any suitable filamentary material, such as thread or cord or the like.

The strip 16 should be of a material, such as paperboard or veneer wood, which possesses some rigidity and acts as a stiffener for the tape which is folded thereabout. The width of the layer of tape should be more than twice the width of the strip 16 so that when the tape is folded longitudinally about the strip 16, the edge portions 17 and 18 overlap to secure the strip within the tape. If desired, any suitable means may be used for securing the overlapping edge portions 17

and 18 in overlapping relation. For example, the overlapping portion may be glued to the portion therebeneath with a water-soluble adhesive or with a water-resistant adhesive, such as asphalt or a resin adhesive. If desired, as illustrated in Fig. 5, stitches 23 may be passed through the unit to secure the tape and the strip 16 in proper position.

The clamp 14, which is used to secure the overlapping ends of the tape to each other to fasten the same about a carton or container, may be of conventional construction. Thus, the clamp may include portions 24 and 25 which are turned back upon the body 26 of the clamp. Preferably, the clamp 14 is made of metal.

The clamp 14 is applied by placing the end portions 12 and 13 of the strap 10 within the clamp and then exerting pressure on the portions 27, 28, 29 and 30 of the clamp to form projections 31 and 32 and corresponding recesses opposite the same, as seen particularly in Fig. 3. When pressure is applied to the portions 27, 28, 29 and 30 of the clamp 14, the layers 12 and 13 of the strap are compressed and distorted, and the projections 24 and 25 are formed in the layer 13 of the strap. These projections are received within the recesses in the clamp, while corresponding recesses are formed in the paper strap 11 to receive the projections 31 and 32. This provides for an interlocking structure in which registering projections and recesses secure the end portions 12 and 13 of the strap 10 against longitudinal movement.

If desired, a coating of a water-resistant material, such as asphalt or a resinous material, may be placed on the outer surface of the strap to prevent the formation of mold. When such a material as asphalt is used, it will, in addition, tend to hold the strap in place on the materials which it binds and prevent slipping of the strap.

If desired, the insert or strip 16 of stiffening material may be treated with a suitable material, such as asphalt or a resinous material, to render the insert water-resistant. In this manner, the entire strap may be made substantially water-resistant. When asphalt is used for this purpose, the insert is not only rendered water-resistant but, in addition, the tacky asphalt surface tends to prevent slippage of the insert within the folds of the tape. The treating material is preferably applied in the liquid state so that the stiffening strip or insert will be substantially impregnated with the material.

The binding device which is thus formed is strong and tough and possesses tensile strength much greater than would be possible if the tape were not longitudinally folded, as in the present construction. The product is not substantially affected by atmospheric moisture. The strap is water-resistant and mold-resistant and possesses a minimum of elasticity. When the product is in use, it will not cut the hands of anyone handling it since it is substantially free of sharp cutting edges. In addition, the material can be readily disposed of after it has served its purpose.

The binding strap is thick and compressible so that when the clamp is applied thereto, the strap is compressed and distorted by the clamp to form the interlocking structure which holds the strap in position.

Although the invention has been described in connection with a particular embodiment, it will be apparent that modifications and changes may be readily made without departing from the spirit and scope of the invention.

I claim:

1. A thick compressible binding strap, comprising a strip of reinforced paper tape having a longitudinal fold therein extending throughout substantially the entire length thereof, an integral strip of stiffening material having a substantial transverse rigidity in said fold with the lateral edges of the stiffening strip being immediately adjacent the lateral edges of the tape, and means for securing the stiffening material to the tape.

2. A binding strap comprising a strip of paper tape having a pair of sheets of paper and a moisture-resistant adhesive carrying filamentary reinforcing material between said sheets, said tape being provided with a pair of spaced longitudinal folds inwardly spaced from the lateral edges thereof, said folds providing laterally-extending flaps of the tape, an integral strip of stiffening material overlying the portion of the tape between said folds and having one surface thereof in engagement with the surface of the tape between said folds, said strip being of substantial transverse rigidity and having relatively slight longitudinal elasticity, the laterally-extending flaps of the tape being turned backwardly upon said stiffening material to enclose the same, and means for securing said tape about said stiffening material.

3. A binding strap comprising a strip of paper tape having a pair of sheets of paper and a moisture-resistant adhesive carrying longitudinally-disposed reinforcing threads between said sheets, said tape being provided with a pair of spaced longitudinal folds extending substantially throughout the length thereof and inwardly spaced from the lateral edges of the tape, said folds providing laterally-extending flaps of tape, a strip of paperboard of a length substantially the same as the length of said strip and of a width only slightly less than the distance between said folds, said paperboard strip being of substantial transverse rigidity and having relatively slight longitudinal elasticity and overlying the portion of the tape between said folds and having one surface thereof in engagement with the surface of the tape between said folds, the laterally-extending flaps of the tape being turned backwardly in overlapping relation over said paperboard strip to enclose the same, and means for securing said flaps in overlapping relation to secure the tape about the paperboard strip.

4. A binding device comprising a strip of paper tape having a pair of sheets of paper and a moisture-resistant adhesive carrying a filamentary reinforcing material between said sheets, said tape being provided with a pair of spaced longitudinal folds, an integral strip of stiffening material in engagement with the tape between said folds, said material having a substantial transverse rigidity and relatively slight longitudinal elasticity the portions of said tape extending laterally from said folds being turned backwardly upon said stiffening strip to enclose the same, means for securing said tape about said stiffening strip, the ends of the tape-enclosed stiffening strip being arranged in overlapping relation, and clamp means engaging the said overlapping ends to compress and distort the same to bring said ends into interlocking relation.

5. A binding strap comprising a strip of paper tape provided with a pair of longitudinal folds extending substantially throughout the length thereof and inwardly spaced from the lateral edges of the tape, said folds providing laterally-

extending flaps of tape, a strip of veneer wood of a length substantially the same as the length of said strip and of a width only slightly less than the distance between said folds, said veneer wood being of substantial transverse rigidity and having relatively slight longitudinal elasticity and overlying the portion of the tape between said folds and having one surface thereof in engagement with the surface of the tape between said folds, the laterally-extending flaps of the tape being turned backwardly in overlapping relation over said veneer wood strip to enclose the same, and means for securing said flaps in overlapping relation to secure the tape about the paperboard strip.

6. A strap of the character set forth comprising a strip of veneer wood, and a strip of paper tape overlying said veneer wood and secured to one side thereof, said paper strip having its edge portions folded back about the side edges of said veneer strip and secured together and to the other side of said veneer wood strip.

FERDINAND W. HUMPHNER.