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SEALING TAPE FOR TUBULAR BAG BODIES

Original Filed Oct. 26, 1942

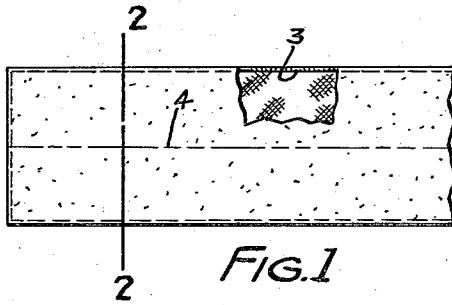


FIG. 1



FIG. 2

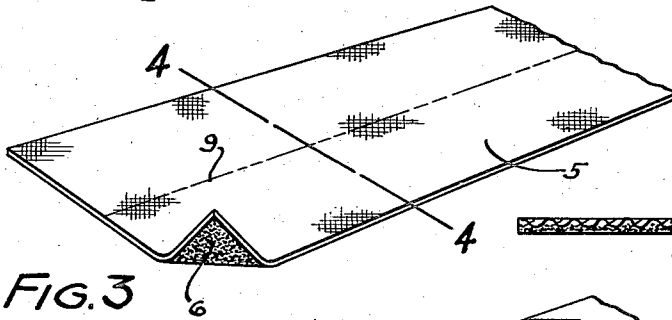


FIG. 3

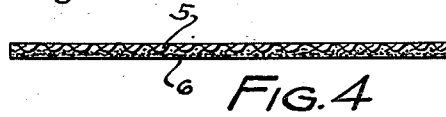


FIG. 4

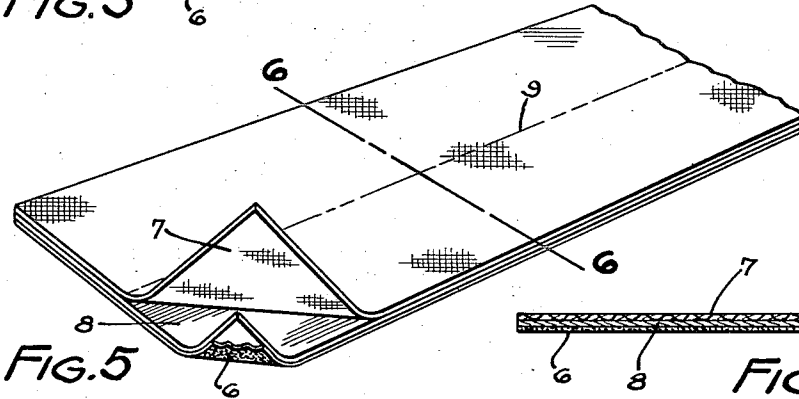


FIG. 5

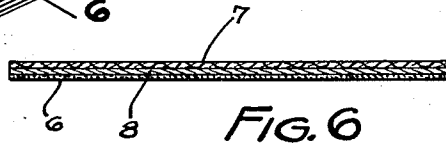


FIG. 6

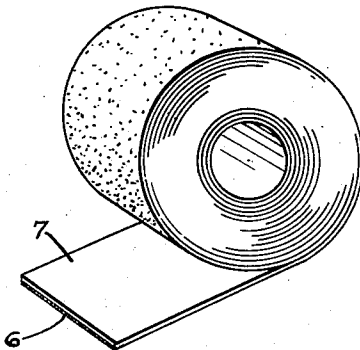


FIG. 7

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SEALING TAPE FOR TUBULAR BAG BODIES

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1 Claim. (Cl. 154—53.5)

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This invention relates to new and useful improvements in sealing tapes and more particularly to a heavy-duty sealing tape adapted for use to close the ends of large tubular bag bodies.

Numerous perishable goods are now shipped in large flexible-walled bags which usually have their walls waterproofed in one way or another to render the bag bodies highly resistant to moisture, chemicals, and other foreign matter. The ends of such flexible-walled tubular bag bodies are usually closed with a strip of sealing tape. Heretofore, it has been customary in the sealing of large fifty and one hundred pound bags to secure the tape to the flattened bag top walls by stitching.

This method has not proven very satisfactory, because by securing the sealing tape to the bag top walls by stitching, the sewing machine needle must pierce the walls of the tape and bag top or end, and this has resulted in the bag bottoms and tops not being sift-proof, particularly if the packaged material is of a finely ground or pulverized nature. Stitching the tape to the bag tube ends also tends to make the closed bag tube ends more or less stiff, because when the tape and bag end walls are thus immovably secured together by the stitching, said walls become, in effect, a single heavy or thick wall which has little or no flexibility. Such stiffening of the closed bag ends has proven detrimental to the handling of the bags, because when the filled bags were roughly handled, the bag walls would frequently fracture along the stitching, as a result of the inability of the secured-together wall portions being unable to freely flex, when subjected to severe internal pressure, which may frequently occur when the filled bags are thrown from a truck onto a loading platform, or are otherwise roughly treated.

During the war, it was necessary to ship large quantities of perishable goods long distances, and large flexible-walled bags were found to be the most economical for this purpose, but had one objectionable feature, in that the closed ends thereof were extremely difficult to make positively secure against leakage and moisture, primarily because of the stitching heretofore used for securing the sealing tape to the bag end walls.

Realizing the urgent need for a seal-tight closure, we set to work to develop a sealing tape which could be applied to the flattened bag tube ends and so secured thereto as to provide a closure which would be positively moisture and sift-proof, and which would not tend to stiffen the bag end walls at the closure, whereby the walls

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constituting the sealed ends of the bag bodies would be substantially as flexible as the walls of the bag body, per se.

After considerable experimental work, we discovered that by constructing a sealing tape from a comparatively wide strip of finely woven textile material and coating at least one side thereof with a suitable thermoplastic material which could subsequently be reactivated by the application of heat thereto, that a sealing tape could be provided which could be readily and quickly folded over the walls of a flattened bag end and secured thereto by simply applying heat and pressure to the walls of the tape, whereby the thermoplastic adhesive would be instantly reactivated and would thoroughly and intimately fuse the walls of the tape to the bag end walls in such a manner as to completely and thoroughly seal the bag end against moisture, and all foreign matter, and whereby the closed bag end would not be weakened as a result of the sealing tape being applied thereto.

An object of the present invention, therefore, is to provide an improved sealing tape particularly adapted for use in connection with large flexible multiple-wall bags to close and seal the ends thereof against sifting, moisture, and other foreign matter.

A further object is to provide a flexible heavy-duty sealing tape composed of a strip of suitable textile material having at least one side thereof thoroughly and completely coated with a suitable thermoplastic material which is so applied to the textile strip as to fill all the pores thereof to render the tape moisture-proof, and said adhesive being capable of being quickly reactivated by the application of heat thereto, whereby the sealing tape may be quickly folded over the walls of a flattened bag top and intimately fused thereto by the application of heat and considerable pressure to the walls of the tape.

A further object is to provide a multi-ply sealing tape comprising at least one ply of a suitable textile material to provide the necessary strength, and a suitable thermoplastic or heat-sealable adhesive being applied to one of said plies adapted to be placed in direct contact with the article to which the sealing tape is to be secured, whereby when heat and pressure are applied directly to the tape walls, said heat-sealable material will effect an intimate bond between the composite tape and the surface to which it is secured.

A further object is to provide a heavy-duty sealing tape for sealing the ends of tubular bag bodies, which sealing tape is composed of a strip

of textile material substantially three inches wide and having one surface thereof impregnated with a suitable thermoplastic material having the characteristics of rendering the tape moisture and chemical-proof, and also whereby the tape may be quickly and conveniently secured to the flattened walls of a bag top by simply applying heat and considerable pressure to the walls of the tape, whereby the thermoplastic adhesive is reactivated to thereby intimately fuse the tape walls to the walls of the bag top, the flexibility of the sealing tape permitting the bag top walls to freely flex when subjected to internal pressure by the contents of the bag body.

The present application is a division of our application, Serial No. 463,424, filed October 26, 1942, which has now become abandoned.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed claim.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claim which follows.

In the drawings:

Figure 1 is a view showing a section of sealing tape with the invention embodied therein;

Figure 2 is an enlarged cross-sectional view on the line 2—2 of Figure 1;

Figure 3 is a perspective view showing a single ply tape having one surface thereof impregnated with a thermoplastic adhesive;

Figure 4 is a cross-sectional view on the line 4—4 of Figure 3;

Figure 5 is a view similar to Figure 3, showing a multi-ply sealing tape;

Figure 6 is a cross-sectional view on the line 6—6 of Figure 5; and

Figure 7 is a view showing the completed tape wound into a roll for storage purposes.

The novel sealing tape herein disclosed, and as shown in Figures 1 and 2, comprises a textile strip 2, which may be completely coated on all sides with a suitable vinyl resin or thermoplastic material, indicated at 3 in Figures 1 and 2, such as one of the well known vinyl resins, whereby the entire strip 2 is rendered moisture and chemical-proof. If desired, but one side surface of the textile strip 2 may be coated with a heat-sealable material to serve as a means for rendering the tape highly resistant to moisture and chemicals, and also whereby the operation of applying the tape to the walls of a bag top may be accomplished by simply applying heat and pressure to the tape walls.

When the tape is to be applied to the walls of a flattened bag tube end, the tape is folded longitudinally substantially along the line indicated at 4, after which the side wall portions thereof may be pressed into firm contact with the bag end walls by suitable pressure elements having means embodied therein for heating the walls of the tape to reactivate the thermoplastic or heat-sealable coating applied thereto.

In Figure 3, there is shown what may be termed a single ply tape 5 comprising an elongated strip of closely woven textile material, to one side of which a suitable heat-sealable or thermoplastic adhesive 6 is applied, as indicated in Figure 4. The thermoplastic adhesive is preferably applied to the surface of the textile tape 5 while hot, or

in liquid form, whereby it will penetrate deeply into the surface of the textile strip 5 to thereby fill all of the pores in the strip to render the tape moistureproof, and also to condition it for application to a bag tube end or other article. When thus treated with a thermoplastic material, and the tape is subsequently applied over the flattened walls of a bag top, it may be quickly secured thereto in leak-proof relation by simply applying heat and pressure to the tape walls, the heat reactivating the thermoplastic adhesive, and the pressure causing the walls of the sealing tape to become firmly bonded to the walls of the bag top, as will be understood.

The thermoplastic adhesive utilized in the construction of the tape is preferably of the quick-drying type, whereby when applied to the surface of the textile body of the tape, it quickly sets or dries, so that the tape may be rolled into a roll, as indicated in Figure 7, whereby the supply of tape may be mounted in the form of a roll in a conventional tape applying machine, as will be understood. The melting point of the thermoplastic adhesive applied to the surface of the tape is sufficiently high to permit the tape to be handled in warm temperatures without danger of becoming tacky. Its melting point, however, is such that it may be quickly reactivated by the application of a predetermined heat thereto for the purpose of bonding it to another surface such as the walls of the bag tube end.

In Figures 5 and 6, there is illustrated a sealing tape 10 of slightly different construction. The sealing tape here shown comprises a plurality of plies, a textile ply 7 and a paper ply 8 securely bonded together by a suitable thermosetting adhesive. If desired, the two plies may be bonded together by a thermoplastic adhesive having a relatively higher melting point than the adhesive utilized for bonding the composite tape to the walls of a bag end.

The textile ply 7 may be of a rather coarsely woven fabric which serves to provide the necessary strength, and the ply 8 is preferably of a suitable Kraft paper, which, jointly with the fabric ply 7, may be rendered impervious to moisture and chemicals as a result of the bonding agent provided between said plies for securing them together.

To the exposed surface of the paper ply 8, a suitable thermoplastic or heat-sealable coating is applied, which thoroughly penetrates into the surface of the Kraft paper ply and provides a bonding agent for securing the composite tape walls to the walls of an open bag top, when the tape is subsequently folded over the walls of a bag top and heat and pressure are applied directly to the tape walls.

The form of sealing tape disclosed in Figures 3 and 4 has been found particularly suitable for use in connection with textile bags, and the form shown in Figures 5 and 6 has been found most suitable for closing and sealing the open ends of relatively large paper bags. Tapes 5 and 10 are each adapted to be folded longitudinally along the line 9, indicated in Figures 3 and 5, when applying one or the other of the sealing tapes to the walls of a flattened bag top, as will be understood.

Since the advent of the novel sealing tape herein disclosed, large flexible-walled paper and textile bags have become very popular as a means in which to ship perishable goods over long distances. The sealing tape herein disclosed when applied to the walls of the flattened bag tube ends

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positively seals the bag ends against leakage and renders them highly resistant to chemicals and other foreign matter, and also the tape does not tend to weaken the walls of the bag ends because of the flexibility of the tape, and particularly because by securing the tape to the bag top walls, as herein disclosed, the marginal edge portions of the contiguous bag top walls are not secured together as in bag closures where the tape is stitched to the bag tops. The sealing tape herein disclosed is, as above stated, extremely flexible, and its strength is substantially equal to that of the walls of the bag body, whereby the filled bags may be roughly handled in transit without any possible danger of the bag bottoms or tops becoming leaky as a result of fractured walls.

It will be apparent to those skilled in the art that we have accomplished at least the principal objects of our invention, and it will also be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiments are illustrative only, and that our invention is not limited thereto.

We claim:

A multi-ply heavy duty sealing tape adapted

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to provide a flexible closure for flexible-walled paper bags consisting of a ply composed of a coarsely-woven textile material, and a kraft paper ply having a coating of a thermoplastic adhesive on one face thereof for bonding said plies and providing a barrier layer impervious to moisture and chemicals, the remaining face of said paper ply having a coating of a heat-activatable thermoplastic adhesive, the melting point of the thermoplastic adhesive bonding said plies being higher than the melting point of the thermoplastic adhesive on said remaining face of said paper ply.

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