Feb. 23, 1932. J. W. CLARK 1,846,949

WRAPPER FOR EXPANSIBLE MATERIAL

Filed Oct. 19, 1928 2 Sheets-Sheet 1

Fig. 1.

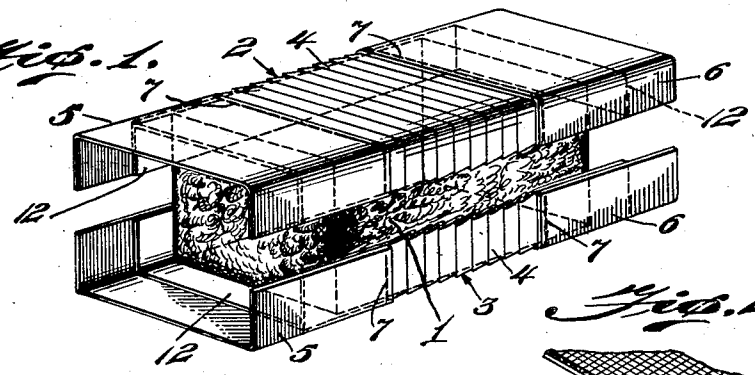


Fig. 2.

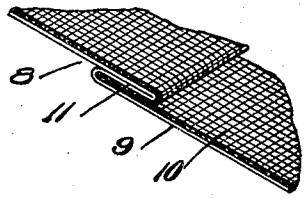


Fig. 3.

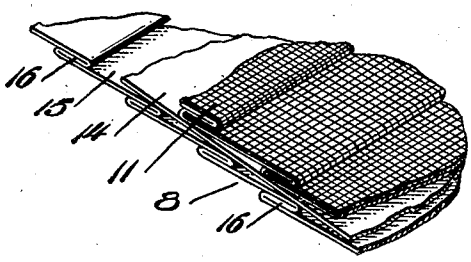


Fig. 4.

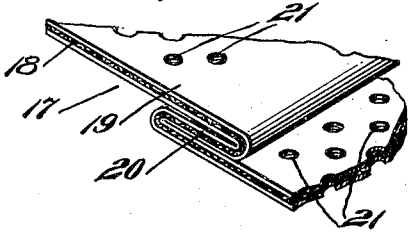


Fig. 6.

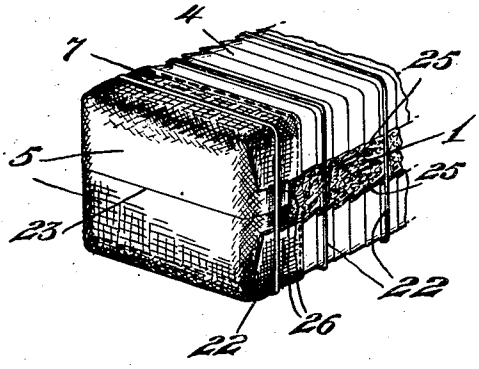
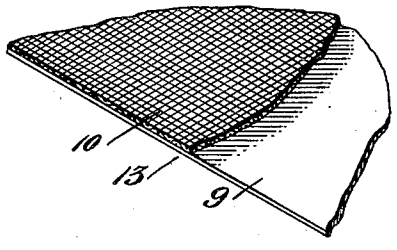


Fig. 5.



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WRAPPER FOR EXPANSIBLE MATERIAL

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Fig. 7.

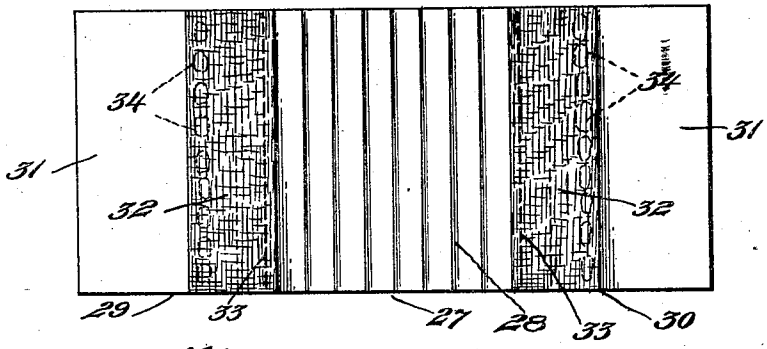


Fig. 8.

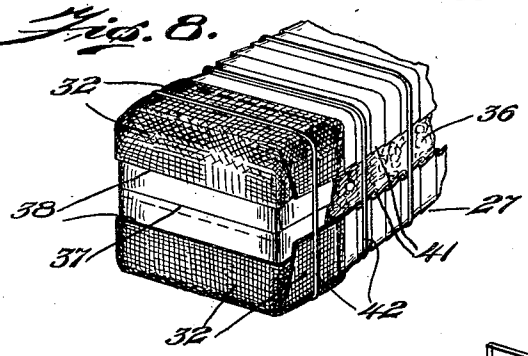


Fig. 9.

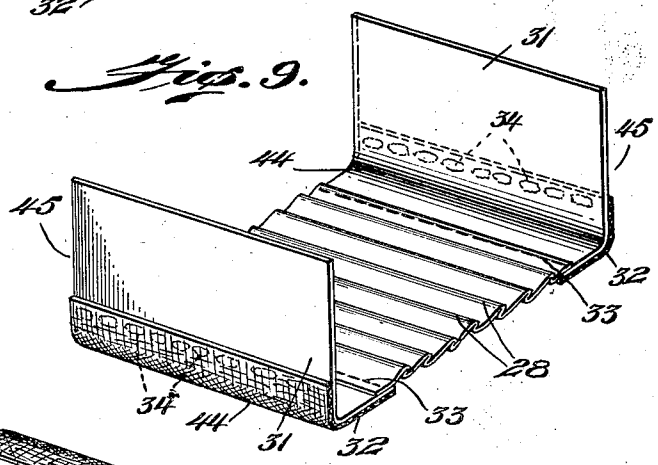
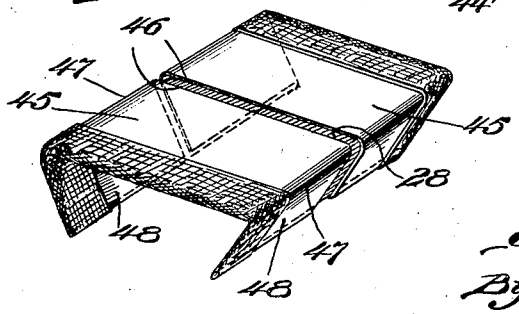


Fig. 10.



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UNITED STATES PATENT OFFICE

JOHN W. CLARK, OF NEW YORK, N. Y.

WRAPPER FOR EXPANSIBLE MATERIAL

Application filed October 19, 1928. Serial No. 313,447.

This invention relates to an improved wrapper for expansible material, such as cotton, wool and the like, which possesses a high degree of strength and toughness and which is capable of expanding at suitable intervals throughout its extent without becoming ruptured, whereby it protects the contents of the package from becoming damaged through contact with foreign matter.

One object of the invention is to provide a wrapper of the character described which possesses an unusual degree of strength and thus offers exceptional resistance to strains tending to tear the wrapper.

A further object of the invention is to provide a wrapper of this character which is capable of a limited degree of expansion at intervals throughout its extent to permit the necessary expansion of the packaged material without injury thereto through the tearing of the wrapper with consequent exposure of the material to contact with foreign matter.

Another object of the invention is the provision of an improved wrapper which may be made up of sections so constructed and arranged as to be especially adapted for application to the side and end portions of a bale of expansible material.

A further object of the invention is to provide an improved wrapper which comprises a laminated portion made up of paper and fabric material secured together throughout a substantial portion of their extent to increase the strength of the wrapper and prevent rupture of the same.

Another object of the invention is the provision of an improved wrapper folded in such a manner as to particularly adapt the same for transport and at the same time render the wrapper especially adapted for application to the usual bale press when unfolded, whereby it may be readily applied to a bale of expansible material.

Other objects and advantages of the invention will be more fully set forth in the detailed description to follow.

Referring to the drawings:

Fig. 1 is a perspective view of a bale or package of cotton or other similar material illustrating one form of wrapper and the manner of applying the same thereto as well as its relation to the bale ties,

Fig. 2 is a detail view of one form of laminated sheet material,

Fig. 3 is a detail view of a form of composite wrapper,

Fig. 4 is a detail view of a modified form of laminated sheet material,

Fig. 5 is a detail view of a sheet of laminated construction,

Fig. 6 is a perspective view of the end portion of a completed bale or package, showing the manner of folding the side and end portions of the wrapper and the arrangement of the bale ties,

Fig. 7 is a plan view of a modified form of wrapper,

Fig. 8 is a perspective view of one end of a bale illustrating the position of a wrapper, as shown in Fig. 6, when applied thereto with the bale ties in place thereon, after the bale has been initially compressed but before the second compression to form a standard or high density bale,

Fig. 9 is a perspective view of a wrapper illustrating its appearance when unfolded and ready for application to a bale or package of expansible material, and,

Fig. 10 is perspective view of a wrapper partially folded in a manner to facilitate its shipment.

In the packaging of cotton, wool and other expansible materials of that character it has been the practice heretofore to employ sheets or strips of burlap or other coarse woven fabric for covering or partially covering the bales or packages when they are initially compressed, and to serve in a measure as a protection for the material, the bales being held against undue expansion by means of a plurality of bale ties passed around the bale or package and over the fabric cover.

This method of packaging has been found to be open to various objections, such as, for example, that dirt, oil, stencil ink and other foreign matter readily penetrates the fabric cover and enters the material with consequent injury to a portion thereof, and such material as cotton or wool adheres to the

fabric so strongly as to make its removal exceedingly difficult.

In order to overcome these and other disadvantages resulting from the former practice I have found that greater protection may be given the packaged material and an improved bale produced by employing a wrapper formed from one or more sheets of paper, some or all of which sheets are provided with pleats extending substantially parallel with the bale ties as described in my pending application Serial Number 260,432, filed March 9, 1928.

While the pleated paper wrapper above mentioned has been found to be satisfactory in use, I have found that under certain conditions of use, such as, for example, in the case of highly compressed bales or bales which will be subject to excessive handling or extremely rough usage, a stronger wrapper may be employed to advantage, and for such uses I propose to employ the form of wrapper shown and described herein.

In the embodiment of the invention illustrated in the accompanying drawing 1 designates a bale of cotton or the like after the same has been compressed, showing wrappers 2 and 3 located upon opposite sides thereof, and each extending a substantially equal distance beyond each end of the bale 1, whereby the end portions may be folded inward to be secured together or overlap each other and entirely cover each end of the bale.

It is to be understood however, that the wrapper shown and described herein, may be applied to the bale by forming one wrapper of greater length than the other, as shown in my pending application Serial Number 284,042, filed June 8, 1928, or the wrappers may be formed of equal length and so applied to the bale or package that one end of each wrapper extends to or slightly overlaps one end of the bale while the opposite end of such wrapper extends a sufficient distance beyond the end of the bale to be folded over and serve as a protection for the entire bale end.

As shown herewith, each wrapper 2 and 3 is formed from a central pleated section 4 and plain unpleated end sections 5 and 6, each end section being secured to the section 4 by a line of stitches 7 or other suitable means.

The pleated wrapper sections 4 may be formed in several ways, such, for example, as illustrated in Figs. 2, 3 and 4 of the drawings. In the form of wrapper illustrated in Fig. 2 of the drawings, the laminated wrapper 8 is formed from a sheet of paper 9 and a sheet or layer of fabric material 10 secured together substantially throughout their extent, as by means of a suitable adhesive material to form a substantially unitary laminated sheet. The sheet 8 is then folded to form therein a plurality of pleats or folds 11 which are arranged substantially parallel with each other.

The fabric material employed in forming the various laminated sheets illustrated herein is preferably made from some inexpensive fibre, such as, for example, jute, sisal, cotton waste, burlap fibre, and the like, and the fabric material may be formed by weaving the fibres to form a loosely woven sheet material, or the fabric material may be formed by laying uniformly spaced strands or threads of the fibre upon the paper sheet 9 to which an adhesive substance has been applied. The woven or unwoven fabric material is secured to the paper sheet or sheets with which it is to be united by the adhesive material and the laminated sheet thus formed is dried and, if desired, the laminated sheet may be passed between suitable pressure rolls or otherwise treated to press the paper sheet and fabric layer into close relationship with each other in forming the laminated sheet material.

The laminated sheet 8, as shown in Fig. 2, is provided with a plurality of folds 11 formed therein and is to be employed for forming the central section 4 of the wrapper as shown in Fig. 1, wherein the laminated sheet 8 provided with folds 11 overlies the bale with the ends thereof extending slightly beyond the ends of the bale as at 12.

The form of composite sheet material shown in Fig. 3 of the drawings is adapted for use, as is the material shown in Fig. 2, of the drawings, for forming the central sections 4 of the completed wrappers, and comprises a layer or sheet 8 which is formed as previously described and shown in Fig. 2, a sheet of unpleated paper 14, and a paper sheet 15 which is provided with a plurality of pleats or folds 16, the pleats or folds 16 in the sheet 15 being arranged substantially parallel with each other and with the pleats 11 formed in the laminated sheet 8. The several sheets 8, 14 and 15 may be joined together at intervals by stitches or staples (not shown), in order that the same may be held against separation from each other in handling and while being positioned in the press for application to a bale.

The form of laminated sheet material 17 shown in Fig. 4 of the drawings is also adapted for use for forming the central sections 4 of the completed wrapper, and comprises a layer 18 of fabric material positioned between two paper sheets 19, the fabric material being united to the paper sheets by a suitable adhesive material, and the entire sheet being folded to form therein a plurality of pleats 20.

The central wrapper sections 4 may be formed from the sheet material as shown in Figs. 2, 3 and 4 of the drawings, or from other arrangements of sheet material, such as, for example, the combination of the sheet material 8 with one or more pleated paper sheets with or without the inclusion of an unpleated sheet 14 as shown in Fig. 3, or by com-

bining the form of sheet material shown in Fig. 4 and designated generally by numeral 17, with one or more pleated paper sheets after a manner similar to that illustrated in Fig. 3 either with or without the unpleated paper sheet 14.

In the formation of the laminated sheet material illustrated in Figs. 2 and 4, I may unite the fabric layer to one or more paper sheets by means of a suitable adhesive material, as by coating the paper sheets with adhesive, applying the fabric layer thereto and passing the composite sheet through rolls to press the fabric and paper material into intimate contact. After the fabric layer and paper sheet have been united together as shown in Figs. 2 and 4, the composite sheet is folded to form pleats therein arranged substantially parallel with each other, which pleats are adapted to be arranged in substantial parallelism with the bale ties when the material is applied to the bale.

A plurality of small openings 21 may be formed in the composite sheet 17, as shown in Fig. 4, in order to permit the escape of air from the expansibe material when undergoing compression to form standard or high density bales after the initial compression and the application of the wrappers. Similar openings (not shown) may be formed in the wrappers shown in Figs. 2 and 3 of the drawings or in such other modified forms as may be used for the central sections of the wrappers in order to permit escape of the air from the expansible material when the bales are given a second compression.

In Fig. 5 of the drawings there is shown a laminated sheet 13 formed from a paper sheet 9 and a layer of fabric material 10 which is similar in all respects to the sheet 8 except that the laminated sheet is not folded to form pleats 11 therein after the fabric layer and paper sheet have been united together. The sheet material 13 is utilized for forming the end sections 5 and 6 of the wrapper, which are joined to the central sections 4 by stitches 7, as previously described, for forming the completed wrappers 2 and 3.

In the packaging of raw cotton the cotton is first given an initial compression, the wrappers previously placed in the press are then folded to conform to the bale and bale ties placed therearound to form what are known as gin bales. These gin bales may be and frequently are given a second compression, without removing the wrapper, to form what are known as standard or high density bales. In the case of these highly compressed bales or bales which are to be subjected to much handling or rough usage a composite fabric and paper wrapper preserves the material from injury or waste and tends to prevent tearing of the wrapper by hooks in handling. It will be seen also that the openings 21 formed in the wrapper permit the air to escape freely without rupturing the wrapper when the secondary compression is effected. The provision of pleats in the composite material forming the wrapper permits the necessary expansion of the packaged material between the bale ties without tearing the wrapper, and a composite wrapper formed of paper and fabric tends to prevent the free edges of the wrapper from becoming torn or frayed.

The paper referred to as employed in the manufacture of the wrappers may be any paper having sufficient tensile strength for the purpose or may be some form of especially prepared paper of the type which is now employed for purposes requiring exceptional strength and toughness, and under certain conditions a specially prepared tough paper may be substituted for the fabric layer previously described.

The sheet material containing parallel pleats is employed for covering the sides of the central or main portion of the bale in order that the portions of the wrappers lying between the bale ties 22 may contain pleats which are capable of opening slightly as the material expands between the bale ties, while the end sections 5 and 6 of the wrappers may be formed of unpleated material as the necessity for expansion is not such at the bale ends as to endanger the wrapper.

The wrappers instead of being formed with unpleated end sections 5 and 6 stitched to the central pleated section 4, may be formed from continuous strips of the material shown in Figs. 2 and 4 of the drawings by pleating the central sections only and leaving the two end sections unpleated.

It will be seen upon reference to Fig. 6 of the drawings that the two opposite end sections 5 may be folded over the end of the bale, and, if desired, joined together by folding as at 23, to completely cover the bale end, while the edges 25 of the wrappers extend over the sides of the bale a sufficient distance to engage over the edges 26 of the end sections and beneath the end tie 22, whereby the covering for the bale end is held firmly against separation.

In Figs. 7 and 8 of the drawings I have shown a modified form of wrapper 27 which comprises a central section 28, which may be formed as shown and described in Figs. 2, 3 or 4 of the drawings, or from any desired combination of the materials shown and described in Figs. 2 and 4 of the drawings with one or more pleated or plain paper sheets. The end sections 29 and 30, as shown in Figs. 7 and 8, may be formed from a section of plain paper 31 to which is applied a fabric section 32 of less length than the paper section 31, the paper and fabric sections at each end of the wrapper being secured to the central section 28 by stitches 33, and the fabric section 32 being further secured to the paper section 31 by a line of adhesive 34. The fab-

ric sections 32 may be formed of any suitable coarsely woven material, as jute, burlap, cotton waste or the like. The fabric and paper sections may also, if desired, be firmly secured together throughout substantially the entire extent of the fabric section by means of a suitable adhesive material, and the fabric covered end of the composite section then secured to the end of the central section 28 by stitches 33 or other suitable means. In either case it will be noted that when the wrappers 27 are applied to the bale 36 as shown in Fig. 8, and after the bale has been initially compressed, the parts of the wrapper are so proportioned that the paper ends of the end sections 29 and 30 will meet or overlie slightly to permit the paper ends to be folded over each other at 37, while the ends of the fabric sections 32 will fail to meet across the end of the bale but will terminate at 38.

After the second compression of the bale, however, the thickness of the bale will be reduced sufficiently so that the free ends 38 of the fabric will meet and permit their being secured together by stitching or in any other suitable manner if desired. It will be seen that by making the paper portions of the end sections of greater length than the fabric portions, those parts of the end sections composed of paper only will extend sufficiently to cover the ends of the bale after the first compression to which the material is subjected, while after the second compression the thickness of the bale will be so reduced that the fabric will cover the entire end of the bale, and the absence of an excess of fabric at the bale end will prevent the formation of an ungainly mass of fabric which would otherwise be formed at the end of the bale after the second compression, as well as resulting in a considerable saving of material.

After the bale 36 has received its initial compression, the side edges 41 of the wrappers 27 will be folded over, as shown in Fig. 8, and bale ties 42 applied with the end tie engaging over the fabric portion of the end section.

While the fabric section 32 is shown as secured to the corresponding paper section 31 by a line of stitches 33 and a line of adhesive 34, a line of stitches may be substituted for the line of adhesive 34, or the fabric section may be joined to the paper section by adhesive throughout substantially its entire extent.

Figs. 9 and 10 show a method of folding the wrappers prior to their application to the bales which reduces them to a small size and renders them capable of being formed into bundles or packages for shipment to the gins where they are to be used, and also facilitates their application to bales of cotton or other expansible material as the expansible material is being compressed in the usual baling press. It is to be understood in this connection that the manner of folding the wrappers, as shown in Figs. 9 and 10, is applicable both to the forms of wrappers shown in Figs. 1 to 7 of the drawings, as well as those shown in Figs. 7 and 8, and the forms of wrappers shown in my copending applications.

As shown in Figs. 9 and 10 of the drawings, and referring for purposes of illustration to the form of wrapper shown in Fig. 7, a portion of each end section 29 and 30 is folded downwardly from the position in which they are shown in Fig. 7, along the line 44 which may substantially coincide with edge of the bale end, thus forming end portions 45 overlying the central section 28 of the wrapper and having their free end edges located adjacent to each other at 46. The side edges of the folded sheet thus formed are then folded over along the lines 47, and the side folds 48 thus formed are pressed against the main body portion of the wrapper to form a folded sheet of substantially less than the superficial area of the extended wrapper.

A plurality of these folded wrappers may be superposed upon each other and bound into packages or bundles which may be readily transported to any desired point for use without being rolled or otherwise folded. When such folded wrappers are received at the gin or other place where they are to be applied to bales of expansible material each wrapper is unfolded into the form shown in Fig. 9 when it is in substantially the desired form for ready application to one side of a bale.

In cotton bales it is the usual practice to sample the bales by cutting the portion of the wrapper overlying the central portion of the bale to remove sample cotton from the interior of the bale. This can be readily done with the present wrappers, and I propose to provide patches formed of a composite sheet material similar to that used in the central section of the wrapper, and provided with pleats, which patches may be gummed to the central portions of the wrappers after they have been cut or torn in removing samples of cotton.

While I have shown and described several forms which my invention may assume in practice, it is to be understood that other forms and arrangements of the wrapper may be employed, and that the application of the same to the bale may be varied somewhat without departing from the spirit and scope of my invention as set forth in the appended claims which are to be broadly construed in the light of my disclosure.

What I claim is:

1. A folded wrapper for expansible material comprising a paper sheet provided with

parallel folds and having the free ends thereof folded back over the central portion and the side edges of the folded sheet folded over upon that side of the central portion which is opposite to that upon which said free ends are folded.

2. A folded wrapper for expansible material comprising one or more paper sheets certain of which are provided with expansible portions, the free ends of said wrapper being folded back over the central portion thereof and the side edges of the folded sheet again folded over upon the opposite side of the central portion from that upon which the free ends are folded.

3. A wrapper for expansible material comprising a rectangular sheet having a portion thereof expansible longitudinally of said sheet and having portions of the ends of the said sheet folded over upon one side of the sheet and the side edges of said sheet folded over the said sheet in the opposite direction from that in which said end portions are folded.

4. As an article of manufacture, a wrapper for a bale of expansible material comprising a paper sheet having an expansible intermediate portion and relatively non-expansible end portions, and fabric reinforcing sections superposed upon and secured to the outer surfaces of the relatively non-expansible portions of said paper sheet and so positioned relative to said wrapper as to overlie portions of the side and end edges of the bale when the wrapper is positioned thereon.

5. A wrapper for a bale of expansible material comprising separate paper sheet members located upon opposite sides of said bale and having end portions folded over to cover the bale ends, and separate fabric reinforcement sections secured to those portions of each wrapper which cover each bale end, said fabric reinforcement sections being secured to the external faces of the wrappers and extending over the end edges of the bale to protect those portions of the wrappers overlying the end edges of the bale from abrasion.

6. In a bale of expansible material, separate wrapper sections located upon opposite sides of said bale and having end portions folded over to cover the bale ends, and separate fabric reinforcement sections secured to the outer surface of those portions of the separate wrappers which cover each bale end and in position to extend over the opposite end edges of the bale when the wrappers are in position thereon, the fabric reinforcement sections secured to the corresponding ends of oppositely positioned wrapper sections being so arranged relative to the wrapper sections as to cover substantially one bale end when the wrapper sections are positioned upon the bale.

7. A bale wrapper for expansible material, comprising a sheet of material having an intermediate portion expansible lengthwise of the sheet, and fabric reinforcing elements secured on the end portions only of said sheet, said elements being located to cover end edges and corners of a bale to which the wrapper is applied.

8. A bale wrapper for expansible material, comprising a sheet of paper having an intermediate portion with transverse pleats extending from side to side thereof, and fabric elements secured on the end portions only of said sheet, said elements being located to cover the end edges and corners of a bale to which said wrapper is applied.

9. A bale wrapper comprising a paper sheet having continuous transverse pleats formed therein each extending from one side edge of the sheet to the other, and a longitudinal crease formed in the wrapper adjacent to each side edge of the wrapper and crossing said pleats, whereby the lateral edges of the wrapper are folded over the central portion thereof along the creases to limit the effective area of the wrapper and prevent opening of the pleats prior to the application of the wrapper to a bale.

10. A bale wrapper comprising a paper sheet having continuous transverse pleats formed therein each of substantially uniform depth throughout its extent and extending from one side edge of the sheet to the other, and a longitudinal crease formed in the wrapper adjacent to each side edge of the wrapper and crossing said pleats, whereby the lateral edges of the wrapper may be folded over the central portion thereof along the longitudinal creases to limit the effective width of the wrapper and prevent opening of the pleats prior to the application of the wrapper to a bale.

11. A bale wrapper for a bale of expansible material comprising two or more paper sheets, one or more of said sheets having continuous transverse pleats formed therein each extending from one side edge of the sheet to the other, and registering longitudinal creases formed in the several sheets and located adjacent to the lateral edges thereof, the longitudinal creases being placed in the sheets after the formation of the pleats and the positioning of the sheets in superposed relation to each other, whereby the lateral edges of the wrapper are folded over the central portion thereof to hold the several sheets against separation and prevent opening of the pleats prior to the application of the wrapper to a bale.

12. A bale wrapper for a bale of expansible material comprising two or more paper sheets, one or more of said sheets having continuous transverse pleats formed therein each extending from one side edge of the sheet to the other and being of substantially uniform depth throughout its extent, and longitudinal creases formed in each sheet adjacent

to the lateral edges thereof and crossing the said pleats, the longitudinal creases of each sheet being so positioned as to register with those of the remaining sheets when the several sheets are arranged in superposed position, whereby the lateral edges of the several sheets may be folded against the central portion of the wrapper to hold the sheets against separation and prevent opening of the pleats prior to the application of the wrapper to a bale.

In testimony whereof I have affixed my signature.

JOHN W. CLARK.