Feb. 5, 1952 J. E. STEWART 2,584,241

REINFORGED AND PROTECTIVELY COATED UNIT LUMBER PACKAGE AND METHOD OF FORMING THE SAME

Filed Feb. 4, 1950 2 SHEETS—SHEET 1

FIG. 3

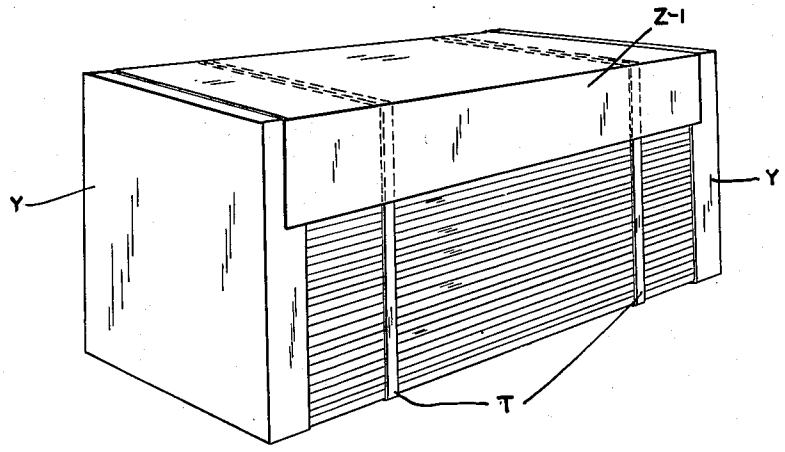


FIG. 1

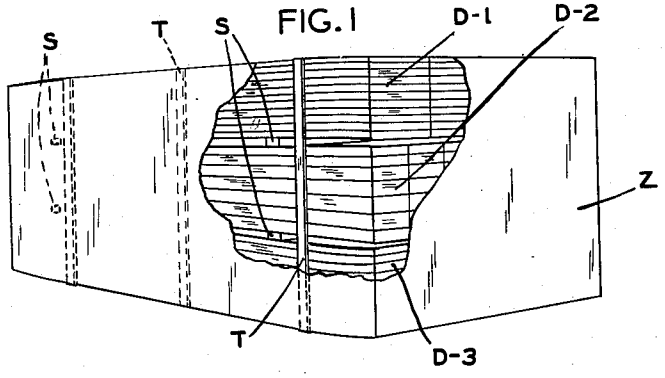
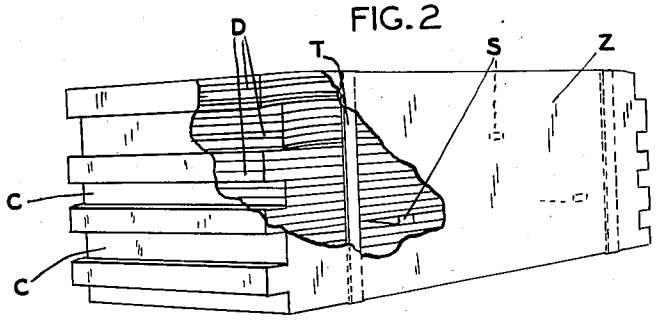


FIG. 2



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FIG. 4

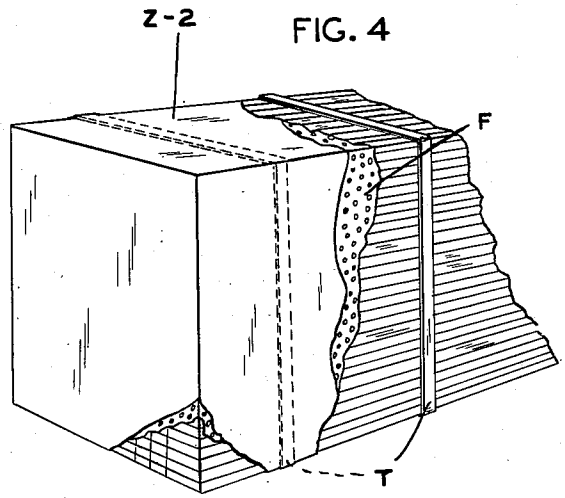


FIG. 7

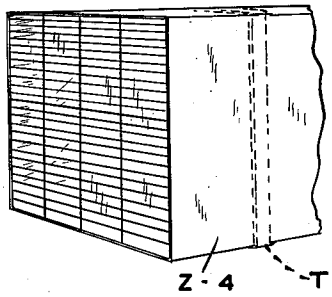


FIG. 5

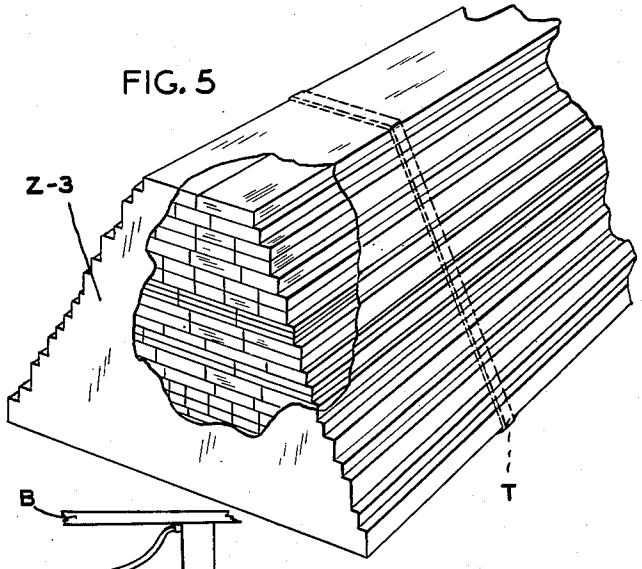
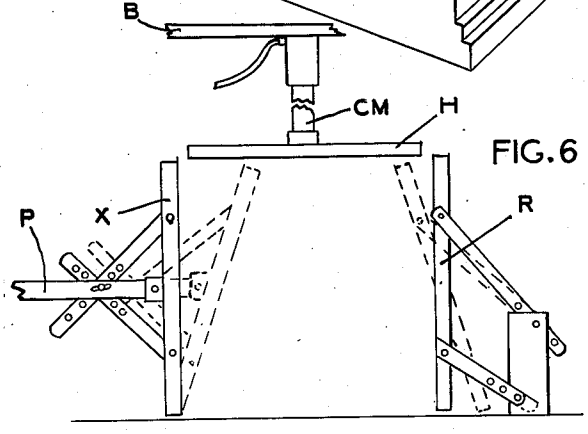


FIG. 6



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Patented Feb. 5, 1952 2,584,241

UNITED STATES PATENT OFFICE

2,584,241

REINFORCED AND PROTECTIVELY COATED UNIT LUMBER PACKAGE AND METHOD OF FORMING THE SAME

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Application February 4, 1950, Serial No. 142,441

2 Claims. (Cl. 206—60)

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My invention relates to a unit package of lumber or analogous strip or sheet material, reinforced and protectively coated for shipment and for outside storage.

This application discloses certain improvements and added features in relation to the structures and methods disclosed in my co-pending application, Serial Number 91,654 filed May 6, 1949, now matured into Patent No. 2,517,939, patented August 8, 1950.

It is an object of my present invention to provide a unit package of lumber or other superimposed analogous material bound and reinforced and protected from dirt and moisture through the combination of a preferably strippable flexible coating and a minimum amount of binding strips or tape whereby units may be shipped without injury and with complete protection from dirt and moisture upon flat or gondola type cars and whereby the units may be stored outdoors indefinitely without any substantial change in the product as originally milled and dried.

Another object is the provision of a simple, commercially successful method for forming a protectively coated and reinforced unit package of lumber and the like at minimum cost.

A further object is the provision of a bound, reinforced and protectively coated package unit of lumber or the like which will withstand jolts and shaking in shipment without displacement of form or injury to the protective covering and which embodies several improvements in structure and method of production upon the unit and method disclosed in my co-pending application, Serial Number 91,654.

More specifically, it is an object of my present invention to provide an economical and commercially successful method for reinforcing and protectively coating units of lumber and analogous material for shipment, handling and storage which lends itself to packages or units made up from boards varying in width and thickness, resulting in at least the greater portions of the sides, ends and top of the package being protectively covered by a strippable coating of tough, flexible, plastic material which serves to bond and tie the outermost boards or strips of the unit together and to cooperate with a minimum of encircling binding elements to constitute a very strong, reinforced unit.

A still further object is the provision of an improved package unit for lumber or analogous material wherein closely cooperating structure serves to bind the boards of the unit together,

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protectively coat the same to exclude moisture and dirt and bind and engage the boards in the package to prevent longitudinal or lateral displacement thereof in shipment upon flat type railroad cars.

These and other objects and advantages of my invention will be more apparent from the following description made in connection with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a perspective view showing an embodiment of my invention in the form of a compacted, reinforced lumber unit protectively coated for resisting wear in shipment and for excluding dirt and moisture, some portions of the protective coating being broken away;

Fig. 2 is a perspective view of a somewhat different form of the invention wherein multilayer sections of the unit are prescaled and disposed in longitudinally offset relations at the ends of the unit;

Fig. 3 is a perspective view of a somewhat modified form of unit wherein protective end covering caps of inexpensive material are employed in combination with a spray coating and minimum of encircling tapes;

Fig. 4 is a fragmentary, perspective view showing still another form of my unit package with portions of the coating layers removed;

Fig. 5 is a fragmentary, perspective view illustrating my method and structure as applied to a unit of lumber made up of boards of various widths;

Fig. 6 is a somewhat diagrammatical end view illustrating apparatus for compressing and compacting the stack or unit of lumber prior to application of binding tape; and

Fig. 7 is a fragmentary, perspective, end view showing still another form of my unit package wherein the top and side walls only of the unit are compressed and covered with a reinforcing and protective spray coating.

In carrying out my invention, I form at the mill, place of production or lumber kiln, a preferably prescaled, compact load unit or stack, as shown in Figs. 1 to 5 of the drawings, comprising a multiplicity of superimposed layers of lumber or other analogous material, each layer comprising a plurality of pieces disposed in compact, side by side relation.

In most instances, as shown in Figs. 1 to 4, the lumber or other pieces of material is formed or piled into a rectangular parallelopiped unit having the longitudinal sides thereof disposed in

parallel relation with the external edges of the boards of each side in substantially common vertical planes.

In the unit structure of Fig. 1, the many boards or pieces comprising the unit are of equal length although perhaps of several different widths and thicknesses but are compactly piled and arranged to have the ends of the unit disposed substantially in common planes perpendicular to the side walls and top of the unit. In many instances I prefer to utilize "stickers" or separation strips S interposed between divisions of the unit stack and extending transversely across the width thereof below the division above. Thus, in the form of the invention illustrated in Fig. 1, two sets of spaced "stickers" strips or spacer elements S are employed, dividing the over-all unit into three divisions D–1, D–2 and D–3 respectively and as shown, being transversely disposed of the unit stack, some distance inwardly from the outer ends thereof, the two sets of "stickers" S as shown in Fig. 1 being vertically aligned.

In Fig. 2 the unit stack is constructed and arranged generally in the manner of the stack or package unit shown in Figs. 1 to 4 of my copending application with multi-layer divisions D of the stack vertically aligned at their longitudinal edges but alternately offset at the ends thereof to define transverse channels C to facilitate subsequent separation, division and handling of the unit by lift truck and to further facilitate loading of the entire unit or package by lift truck or other equivalent apparatus.

In the structure shown in Fig. 2, I employ a plurality of "stickers" or spacer elements S, as shown two of said "stickers" being transversely applied in the lower, intermediate portion of the stack spaced some distance from the ends thereof and a single "sticker" being transversely applied to the central upper portion of the stack to produce separation of divisions of the stack; and as will be later fully described, to produce in combination with binding straps and a binding and protective cover, a very efficient clamping medium for preventing longitudinal and lateral displacement of the individual boards or elements during transportation of the unit.

In the form of unit package shown in Fig. 3, the individual boards are very uniform in length and thickness and are arranged or piled in compact, superimposed layers with ends and sides of the unit parallel and disposed in substantially common vertical planes. In this form, as shown, no "stickers" are employed as in the form shown in Figs. 1 and 2.

The stack or unit pile of lumber shown in Fig. 5 is compactly arranged in similar manner to that shown in Fig. 3 but as illustrated, comprises successive layers of boards varying in width.

In all forms of the invention, the unit stack or pile is very compactly formed with the individual pieces of the successive layers being compacted in side by side relation and with the multi-ply, over-all thickness of the stack being preferably compacted or compressed prior to initial binding of the unit.

In Fig. 6 an apparatus is diagrammatically illustrated which may be utilized to apply compression to the sides and top of the stack or pile before application of the binding tapes. As shown, this apparatus includes an upper hydraulic compressor mechanism CM having an elongated, flat compression head H which is

adapted to engage the top of a unit stack and apply pressure downwardly from a rigid anchoring base B. Fig. 6 also illustrates diagrammatically an upstanding, stationary and angularly adjustable resistance bed R with which is cooperatively associated, a hydraulically actuated plunger P having affixed thereto an upstanding, angularly adjustable pressure head X for engaging against the greater portion of the length of the unit stack to apply pressure horizontally of the stack in the direction of the fixed resistance wall R.

In the production of my reinforced and protected lumber unit, two or more circumferentially extending, light, preferably metallic binding tapes T are applied, tightened and secured after the unit stack has been formed, arranged and compacted. It is to be understood that actual compression apparatus is not required in all instances in carrying out my method. Metallic tapes T surround the top, bottom and side walls of the unit and preferably, in every instance, a pair of said tapes are utilized, disposed inwardly a relatively short distance (varying from six inches to two and one half feet) from the ends of the unit stack. The metal tapes or other binding elements T are tightly drawn to further compress the unit structure and where "stickers" or separator strips S are utilized, serve to deflect the positions of the boards or other sheet material in the upper and lower divisions of the unit, above and below the sets of separator strips, distorting the straight line relationship of the boards and thereby producing a clamping action and frictional binding effect which materially improves the stability of the package and is an important factor in preventing longitudinal as well as lateral displacement of the layers and individual boards due to intense jars and jolts during transportation of the package.

In Fig. 1, three binding tapes are employed although only two are usually necessary because of the cooperative binding effect of my encysting layer or coating. The central binding tape T as shown in Fig. 1, when fully tightened and secured, further distorts the straight line extension of the individual layers and boards and furnishes additional frictional resistance between the boards to overcome the effects of jolts in transportation.

After the stack has been formed, compacted and bound with the minimum number of tapes T, the units as shown in Figs. 1, 2, 4 and 5 are next spray coated with a flexible, moisture-proof, oil-proof and dust-proof coating of a material which will withstand wear in transit, handling and storage but which preferably may be torn off or stripped in sections, generally along desired lines of fracture. In the form of unit package illustrated in Figs. 1, 2, 4 and 5, all walls and portions of the package with the exception of the bottom, are coated preferably by spray method with a water-proof, somewhat elastic and fire resistant composition which will not be materially absorbed by the lumber or by bonding thereto. Various compositions or solutions capable of being effectively sprayed in conventional spray guns may be employed, such as a composition containing vinyl copolymer resins. Said resins consist of vinyl chloride and vinyl acetate of high strength. These materials are used with a suitable plasticizer such as tricresyl phosphate dicotyl phthalate or chlorinated paraffin or a combination thereof. The vinyl resins and plasticizer are put into a suitable solution

such as acetone, toluene, methylethyl ketone or combinations of two or more of said solvents. Other coatings utilizing latex in acetate with various pigments may also be used, although plastic coatings are preferred.

In applying the coating by spray method, the material is first preferably in the form of the invention of Figs. 1, 2 and 5 sprayed to form a web coating crossing the ends of the boards, the longitudinal edges and the longitudinal interstices throughout the package, whereafter the spraying is continued over the web coating to form a substantially uniform, encysting-covering, bonded to the outer surfaces of the boards of the unit to the extent of securing the successive layers and surfaces of the boards, together into a unitary package but nevertheless, because of the plastic composition, not being materially absorbed by the pores and grain of the material encysted. The protective coating Z sprayed upon the compacted unit stack bound together by the tapes T serves as an important binding medium and reinforcement to the package while in addition, constitutes a continuous protective covering to exclude moisture, air, oil and dust and to cushion the outer surfaces of the material against wear and damage.

In the package unit illustrated in Fig. 3, the rectangular ends of the stack bound by the two tapes T are covered with inexpensive cap members Y which may be constructed from heavy cardboard, corrugated board or sheet metal and which closely fit the rectangular ends of the stack. In this form of package, as shown, the upper portion only of the unit is protectively coated by a spray coating Z–1 of the materials described, the top and upper side portions of the stack being continuously covered with the coating Z–1 overlapping materially the inner edges of the end caps Y.

It is of course to be understood that in all cases, my protective and reinforcing coatings are sprayed over the tapes T in application to the units.

In Fig. 4 in place of initial web spraying or coating of the top, sides and ends of the unit stack, I provide an initial sheet covering F of flexible, foraminous material such as tough paper or fabric which may be initially folded over and adhered at points to the external surfaces of the stack. Thereafter, the top, side and end walls of the unit are coated, preferably by spraying with a plastic coating Z–2 of the type herein described. In this form of the invention, transverse application of the spray nozzles and application of coating material is not necessary with the result that less plastic material is required than in the coatings illustrated in Figs. 1, 2 and 5. Sufficient of the plastic material works through the apertures of the foraminous, flexible covering material F to adequately adhere the outer coating to the boards or material while the paper or fibrous sheet F acts as additional reinforcing binding for the package.

In Fig. 7, a less expensive but highly efficient package covering and method is illustrated, particularly adapted for commercial use in standardized lumber units. In this form of the invention, the parallelopiped stack is formed and is then compressed and binding tapes T applied as in the forms of the invention previously described. A continuous spray coating Z–4 of preferably plastic materials of the nature described herein, is applied to the top and preferably the full height of the sides covering the tapes T and bonding together the longitudinal edges and top surfaces of the boards directly covered thereby.

The unit package so formed preferably embodying the stackers or spacers S utilized in the form illustrated in Figs. 1 and 2 has demonstrated excellent success in withstanding the jolts and friction of transportation and adequately protects the lumber contained in the package from injury by dirt, moisture and grease.

In Fig. 5, a somewhat different embodiment of my invention is applied to a unit stack or package made up of a multiplicity of boards varying in widths. In this form of the invention, the successive layers of boards disposed in side by side relation are formed to make up a unit of trapezoid cross section, symmetrically tapering from the longitudinal sides at the bottom to the top. This structure enables boards of odd widths to be compactly formed into a stack unit which adapts itself to receive the reinforcing, protective coating Z–3 which is spray coated upon the sides, top and end walls of the unit in the manner previously described with reference to the forms of the invention shown in Figs. 1 and 2. With this form of the invention, the material may be initially compressed by such apparatus as that shown in Fig. 6 before application of the transversely disposed binding tapes T whereafter the spray coating is applied.

I have discovered that with spray coating of the type described, an unexpected efficiency or reinforcement and binding of the assembled boards or other analogous material is obtained. The coating nevertheless lends itself to being readily stripped either longitudinally or transversely of the package. With the reinforcement and retaining features of my protective coating a very minimum amount of binding is required, in most packages varying in length from 10 to 16 feet, only two binding tapes inset a short distance from the ends of the stack unit are necessary. In 18 to 20 feet lengths or over, three binding tapes are recommended.

I have also discovered that the use of the "stickers" in combination with the protective binding coating and tapes provides a package which will resist all tendency of longitudinal or lateral displacement of the individual boards and layers during transportation.

From the foregoing description, it will be seen that I have provided at low cost, a highly efficient unit package for shipment and storage of lumber or other analogous sheet material capable of being loaded and unloaded by lift truck or other package-engaging means and adapted to protect the contents against moisture, oil and dirt during transportation and storage.

The staggered divisional end structure of my unitary package provides for channels which may be readily engaged by lifting elements such as the tines of a lift truck to enable the package to be handled bodily as a unit in loading, unloading and filling orders at the retail yards.

It will further be seen that I have provided an improved and commercially successful method for forming a protectively coated and reinforced unit package of lumber and the like at minimum cost.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

1. A unit package of lumber reinforced and protectively coated for outside storage and

shipment comprising a multiplicity of boards arranged in superimposed layers providing divisions each having a thickness equal to the aggregate thickness of a plurality of boards and a width equal to the aggregate width of a plurality of boards, the ends of a substantial number of boards lying substantially in a pair of opposed planes perpendicular to the planes of the longitudinal edges of the boards, at least one spacer element disposed transversely of and between each pair of vertical divisions of said unit, each spacer element being of elongated narrow form having a length substantially equal to the width of said unit and being positioned inwardly from the ends of said boards and in substantially parallel relation to the plane of the ends of said boards for engagement with all of the boards having surfaces exposed between the vertical divisions, said unit having a minimum of relatively non-stretchable binding strips secured circumferentially of the length of the unit in such relation to said spacer elements as to cant the boards of the divisions about the spacer elements and distort the boards from their straight-line position, said binding strips being disposed about the exposed surfaces of the top, side and bottom boards of the unit for exerting both lateral and vertical compressive forces on the unit, a protective binding covering over at least the entire top and sides of the unit, said covering being a continuous coating of tough, flexible moisture-proof material of a nature to bond to the entire outer surfaces of the boards as well as bridge the spaces formed between the boards, the distortion of the boards from their straight-line position increasing the degree of frictional contact between the boards, and said covering resisting relative movement between the boards of the unit and supplementing the binding strips in reinforcing the unit.

2. A unit package of lumber reinforced and protectively coated for outside storage and shipment comprising a multiplicity of boards arranged in superimposed layers providing superimposed divisions each having a thickness equal to the aggregate thickness of a plurality of boards and a width equal to the aggregate width of a plurality of boards, the ends of a substantial number of boards lying substantially in a pair of opposed planes perpendicular to the planes

of the longitudinal edges of the boards, at least one spacer element disposed transversely of and between each pair of vertical divisions of said unit, each spacer element being of elongated narrow width having a length substantially equal to the width of said unit and being positioned inwardly from the ends of said boards and in substantially parallel relation to the plane of the ends of said boards for engagement with all of the boards having surfaces exposed between the vertical divisions, said unit having a minimum of relatively non-stretchable, flexible binding strips secured circumferentially of the length of said unit in such relation to said spacer elements as to cant the boards of the divisions about the spacer elements and distort the boards from their straight line position, said binding strips being in direct contact with the exposed surfaces of the top, side and bottom boards of the unit for exerting both lateral and vertical compressive forces on the unit, a spray-coated covering over at least the entire top and sides of the unit, said covering being a continuous coating of tough, flexible moisture-proof material of a nature to bond to the entire outer surfaces of the boards as well as bridge the spaces formed by the spacer elements, the distortion of the boards from their straight-line position increasing the degree of frictional contact between the boards, and said covering resisting relative movement between the boards of the unit and supplementing the binding strips in reinforcing the unit, said covering nevertheless being strippable from said unit.

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