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METHOD OF MAKING PALLETS

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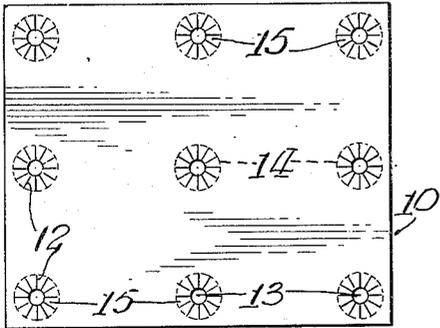


FIG. 1.

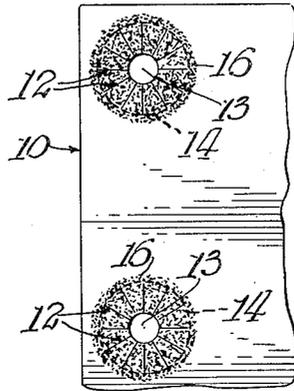


FIG. 2.

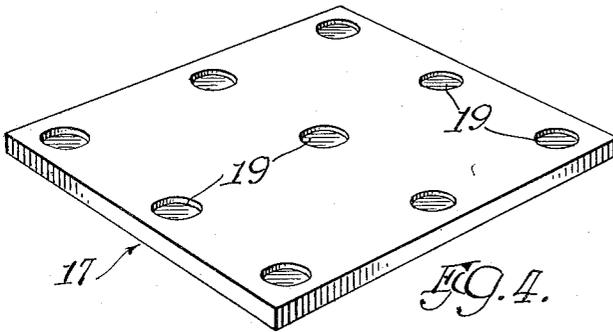


FIG. 4.

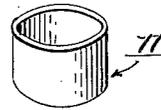


FIG. 3.

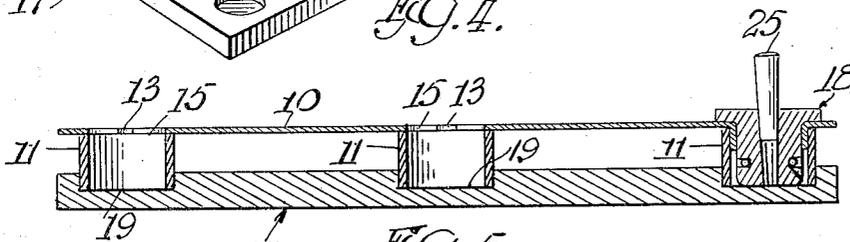


FIG. 5.

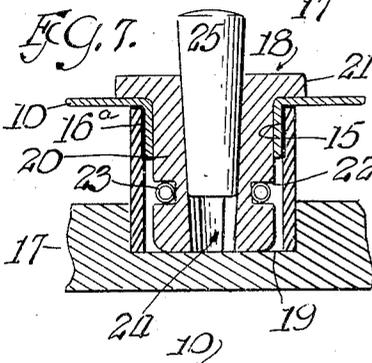


FIG. 7.

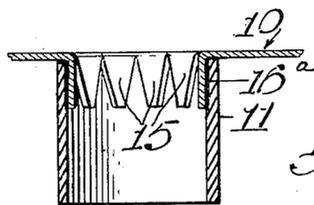


FIG. 8.

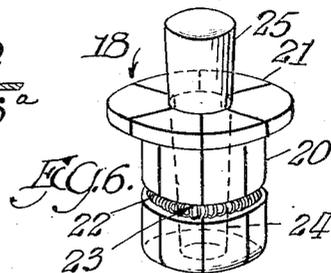


FIG. 6.

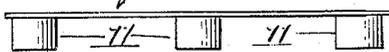


FIG. 9.

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METHOD OF MAKING PALLETS

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9 Claims. (Cl. 93—1)

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This invention relates to improvements in methods of and apparatus for making pallets and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The invention is more particularly concerned with pallets embodying a load supporting platform of sheet material and tubular supporting columns or members therefor and in which integral tongue-like parts on the platform are entered into and are adhesively united to associated portions of the internal surface of the upper end of said columns.

One of the objects of the invention is to provide a simple, practical and efficient method of positioning the adhesively coated tongues, formed in certain outlined areas of the load supporting platform of the pallet, within the upper end of an associated tubular supporting member or column and for pressing such tongues outwardly into a firm, adhesively united engagement with a portion of the internal surface of the upper end of the column to afford a connection of great strength and rigidity between said platform and the supporting columns of the pallet.

Another object of the invention is to provide a method of this kind which may be carried out with simple and inexpensive apparatus by persons not necessarily skilled in making pallets.

Also, it is an object of the invention to provide a method of this kind which assures uniformity in the finished pallets.

Furthermore, it is an object of the invention to provide simple and efficient apparatus for bending the adhesively coated tongues of the platform into substantially right angled position within the interior of the associated column and for then pressing said tongues outwardly into an adhesively united engagement with the column.

The above mentioned objects of the invention, as well as others, together with the advantages thereof, will more fully appear as the specification proceeds.

In the drawings:

Fig. 1 is a plan view of the platform sheet of the pallet after it has been operated upon to produce in certain predetermined areas thereof, sets of tongues, integral at their outer ends with the platform, within a circular outline.

Fig. 2 is a fragmentary view of a corner part of the platform appearing in Fig. 1 on a scale enlarged thereover and more particularly shows an adhesive coating as applied to the tongues of each set and of an outline corresponding in shape

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to but of an area larger than the area of said tongues.

Fig. 3 is a perspective view of one of a plurality of tubular supporting members or columns for the platform sheet appearing in Fig. 1, but on the scale of Fig. 2.

Fig. 4 is a perspective view of a certain support device for the columns, which includes holding means therefore that position a group of such columns to register with the positions of the sets of tongues in the platform.

Fig. 5 is a vertical sectional view through the device of Fig. 4, on a scale enlarged thereover and shows more particularly the way in which the columns are disposed therein and the way in which the platform sheet is disposed upon the columns with the sets of tongues in said sheet registering with the columns.

Fig. 6 is a perspective view on a scale enlarged over that of Fig. 5 and shows a tool or apparatus whereby the sets of adhesively coated tongues of the platform sheet may be entered into and then pressed outwardly into an adhesively united engagement with the interior of the upper end of an associated column.

Fig. 7 shows the tool or apparatus of Fig. 6 in operative position within a column and after it has been radially expanded to press the tongues of a set of tongues of the platform sheet into engagement with the column.

Fig. 8 is a detail vertical sectional view through a fragment of the platform and associated column of a completed pallet and will be mentioned in more detail later.

Fig. 9 is a view in side elevation of the finished pallet on the scale of Fig. 1.

Referring now in detail to that embodiment of the invention illustrated in the drawing, the pallet produced in accordance with the improved method best appears in side elevation in Fig. 9 and it includes a load bearing platform 10 of sheet material and a plurality of supporting members or columns 11—11 made of short sections of relatively thick walled paper tubing, one of which columns appears in perspective in Fig. 3.

The member or platform 10 is preferably made from a rectangular sheet of 60 point kraft board and as shown it is longer in one direction than it is in the other and a sheet of such board appears best in Fig. 1. Certain predetermined areas of the platform sheet, arranged in longitudinal and transverse rows thereon, are operated upon to form a plurality of slits 12 therein, which radiate from a center hole 13 in each area and terminate at their outer ends in a circle 14.

This arrangement of slits forms in each area a plurality of inwardly tapering tongues 15 which are integral with the platform sheet. Said tongues are joined at their wider outer ends to the platform sheet 10 on said circle 14 and about which said tongues may be bent into a position extending at a right angle to said sheet. There is a row of such areas extending about the margin of the platform sheet and a central area, as best appears in Fig. 1.

Each area has applied thereto on one side of the sheet, an adhesive coating or material 16 and the periphery of said coating is spaced outwardly from said circle 14, as best appears in Fig. 2. The circle 14 has a diameter approximating the inside diameter of a supporting member or column 11 and the periphery of said coating has a diameter at least approximating the outside diameter of said member or column, although it could have a larger diameter than said outside diameter of the column. This provides an annular zone of coating outwardly of the circle 14.

In making up a pallet from a platform sheet, such as appears in Fig. 1 and a plurality of supporting members or columns 11, such as appear in Fig. 3, they are assembled together, by disposing the columns in a position wherein their inner surfaces will register with the circles 14. After the sheet 10 is disposed upon the upper ends of said columns with the adhesive coating 16 on the under side thereof, and with the circles 14 in register with the inner surfaces of the columns, the tongues 15 are depressed downwardly into a right angular position to enter the upper ends of the column. This disposes the adhesive coating on the outer surface of each tongue facing the inner surface of the upper end of the associated tubular column 11 and in a position to be pressed outwardly into a good bond and union with said column.

To assure a quick, easy and accurate positioning of the column, in accordance with the disposition of the adhesively coated tongue areas of the sheet 10, I provide a gauge-like support 17, which appears in perspective in Fig. 4 and to simultaneously bend the tongues of each area into the upper end of the associated column and then press the coated surfaces of the tongues against the inner surface of said end of the associated column I provide the tool or device 18 appearing in Fig. 6 of the drawing.

The support 17 may be in the nature of a rectangular board of at least the area of the sheet and in areas in the upper surfaces thereof, which correspond to the areas defined by the circles 14 of the sheet 10, are shallow recesses 19-19, each of a diameter to fairly snugly receive the bottom end of a tubular column 11, as appears in Fig. 5.

The device 18 is in the form of a radially extensible or cylindrical plug-like body 20 having a radial flange 21 at its top end. Said device is composed of a plurality of segmental parts having lateral, radial meeting faces and in the outside of said parts, below the flange 21, is an annular groove 22 in which is located an elastic element 23 in the form of an endless helical contractible spring. Centrally in the body and flange of the device is a bore 24 which tapers in diameter toward the bottom end and this bore is adapted to receive a complementally tapered wedge 25, the upper end part of greater diameter being normally disposed above the top of the flange 21. The body 22 has a length approximating the axial length of a column 11, and when

the segmental parts of the body are in their normal contracted radial condition, under the action of the elastic element 23, said body has such a diameter as to be easily insertable into the upper end of the associated column, when the tongues 15 are disposed therein.

In the use of the device, with the platform sheet 10 disposed upon the upper end of the columns 11, as appears in Fig. 5, the bottom end of the device 18 is disposed upon the tongues 15 of one group of tongues and is then forced downwardly thereupon. This causes the tongues 15 to bend downwardly about the circle 14, as a hinge, to enter the top end of the associated column. This pressure is maintained until the flange 21 engages the body of the sheet 10 to afford a good attaching bond for the top edge of the column with the margin of the coating 16 outwardly of the circle 14. Thereafter, the top end of the wedge is struck a good solid blow, as with a mallet. This drives wedge downwardly into the body 20 of the device 18 and causes the body segments to expand radially outward and press the adhesive coating 16 on the tongues 15 into a good tight bonding engagement with the interior of the upper end of the column. The device may be left in place, if desired, and another one employed for use in connection with another set of tongues 15 and associated column. After the parts have been assembled, as mentioned, and the adhesive coating 16 has dried, the devices 18 may be removed.

Thereafter, the finished pallet may be removed from the support 17 and the same used for another assembly operation.

It is obvious from the above that the outer faces of the tongues in each group are adhesively united to the inner surfaces of the upper end of the associated column and that the upper extremity of said column is adhesively united to the underside of the platform sheet outwardly of the circle 14 and these points of juncture are indicated by the relatively heavy black lines 16a at the upper end of Figs. 7 and 8.

The improved method may be readily practiced by inexperienced operators and insures uniformity in production of the pallets and may be carried out by simple and inexpensive apparatus.

While in describing the invention I have referred in detail to certain sequence in steps of carrying out the method, as well as to apparatus whereby such steps may be practiced, the same is to be considered only in the illustrative sense and therefore I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:

1. The method of making a pallet which consists in providing a platform member of sheet material formed in each of certain outlined areas with a set of bendable tongues integral at their outer ends with the platform member at the outline of each area and having an adhesive coating on one side of said tongues, providing a supporting member for each set of tongues, which supporting member is tubular, at least at one end, disposing each supporting member in centered relation with respect to the area containing the associated set of tongues and on that side of the platform member having the adhesive coating, bending the tongues of each set out of the plane of the platform member toward the associated supporting member so as to enter the tubular end thereof, and in pressing said tongues outwardly

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into adhesively united engagement with the internal surface of the tubular end of the associated supporting member.

2. The method of making a pallet which consists in providing a platform member of sheet material formed in each of certain outlined areas with a set of bendable tongues integral at their outer ends with the platform member at the outline of each area, and having an adhesive coating on one side of said tongues, providing a platform supporting member for each set of tongues, which platform supporting member is tubular, at least one end, arranging said supporting members to match up with said areas with their other ends held in fixed relation and with their tubular ends directed upwardly, placing the platform member upon the upper ends of said supporting members with the area containing the associated set of tongues and the adhesive coating on said tongues engaged with said upper ends of said supporting members, bending the tongues of each set out of the plane of the platform member toward the associated supporting member so as to enter the tubular end thereof, and in pressing said tongues outwardly into adhesively united engagement with the internal surface of the tubular end of the associated supporting member.

3. The method of making a pallet which consists in providing a platform member of sheet material formed in each of certain outlined areas with a set of bendable tongues integral at their outer ends with the platform member at the outline of each area, and having an adhesive coating on one side, which extends to a zone outwardly of the set of bendable tongues, providing a platform supporting member for each set of tongues, which platform supporting member is tubular, at least at one end, disposing each supporting member in a centered relation with respect to the area containing the associated set of tongues and on that side of the sheet containing the adhesive coating and with the extremity of said end engaged with said zone of adhesive outwardly of said tongues, bending the tongues of each set out of the plane of the platform member toward the associated supporting member so as to enter the tubular end thereof, and then pressing said zone of adhesive into united engagement with said extremity of the associated supporting member and pressing said tongues outwardly into adhesively united engagement with the internal surface of the tubular end of the associated supporting member.

4. The method of making a pallet which consists in providing a platform member of sheet material formed in each of certain outlined areas with a set of bendable tongues integral at their outer ends with the platform member at the outline of each area, and having an adhesive coating on one side, providing a platform supporting member for each set of tongues, which platform supporting member is tubular, at least at the upper end, providing a support for the lower ends of said supporting members, so constructed in areas corresponding to the first mentioned areas as to hold the lower ends of the supporting members against displacement and with their upper ends exposed above said support when said members have been positioned on said support, positioning the platform member upon the upper ends of the supporting members with the adhesive coating engaged upon the extremities of the upper ends of the supporting members, and then pressing said tongues outwardly into adhesively

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united engagement with the internal surface of the tubular end of the associated supporting member.

5. The method of making a pallet which consists in providing a platform member of sheet material formed in each of certain outlined areas with a set of bendable tongues integral at their outer ends with the platform member at the outline of each area, applying an adhesive coating to one surface of the tongues of each set, providing a platform supporting member for each set of tongues and each of which is tubular, at least at one end, and has an outline shape corresponding to that of the associated area, disposing each supporting member with the outline of said tubular end centered with the outline of its associated area and engaged with the adhesive coating on the associated set of tongues, bending the tongues of each set out of the plane of the platform member toward the associated supporting member so as to enter the tubular end thereof, and then pressing said tongues outwardly into adhesively united engagement with the internal surface of the tubular end of the associated supporting member.

6. The method of making a pallet which consists in providing a platform member of sheet material, formed in each of certain outlined areas, with a set of bendable tongues integral at their outer ends with the platform member at the outline of each area, applying an adhesive coating to one surface of the tongues of each set, providing a platform supporting member for each set of tongues and each of which is tubular, at least at one end, and has an outline shape corresponding to that of the associated area, arranging said supporting members to match up with said areas with their other ends held in fixed position of support and with their tubular ends directed upwardly, placing the platform member upon the upper ends of said supporting members with the adhesive coating on each set of tongues facing the associated supporting member and with the upper end extremity of each supporting member centered with respect to the tongues in the associated area and engaged with a part of the adhesive coating thereon, bending the tongues of each set out of the plane of the platform member toward the associated supporting member so as to enter the tubular end of the associated supporting member, and then pressing the tongues of each set outwardly into adhesively united engagement with the internal surface of the tubular end of the associated supporting member.

7. The method of making a pallet which consists in providing a platform member of sheet material formed in certain circularly outlined areas with a set of bendable tongues integral at their outer ends with the platform members at the circle of said areas, applying an adhesive coating to one surface of the tongues of each set, and to a zone outwardly thereof, providing a tubular platform supporting member for each set of tongues and having an inside circular diameter approximating that of said circular outlined area of each set of tongues, disposing each supporting member with its upper end centered with the circular outlined area of each set of tongues and with the extremity of said end engaged with the adhesive coating in said zone, outwardly from the circular outlined area of said tongues, bending the tongues of each set out of the plane of the platform member and into the upper end of the associated supporting

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member, and then pressing said tongues outwardly into an adhesively united engagement with the internal surface of the said upper end of the associated supporting member.

8. The method of making a pallet which consists in providing a platform member of sheet material formed in each of certain outlined areas with a set of bendable tongues integral at their outer ends with the platform member at the outline of each area, applying an adhesive coating to one surface of the tongues of each set, and to a zone outwardly thereof, providing a platform supporting member for each set of tongues and each of which is tubular, at least at one end, and has an outline shape corresponding to that of the associated area, disposing each supporting member with the outline of said tubular end centered with the outline of its associated area and with the extremity of said end engaged with the adhesive coating on said zone outwardly from the outlined area of the associated set of tongues, providing a radially expandible tool of a normal diameter to be entered into the tubular end of said supporting member, centering said tool with the upper surface of an area of a set of tongues and pressing said tool against the tongues of said area causing them to bend out of the plane of the platform member and to enter said tubular end of the supporting member, and manipulating said tool to expand radially and to force said tongues outwardly into an adhesively united engagement with the internal surface of said tubular end of the supporting member.

9. The method of making a pallet which consists in providing a platform member of sheet material formed in each of certain areas thereof

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with a set of bendable tongues integral at their outer ends with the platform and which outer ends are disposed in a circle, applying an adhesive coating to one surface of the tongues in each of the sets thereof, providing a tubular supporting member for each set of tongues, providing a support for the bottom ends of said member and which support is so constructed in areas corresponding to the first mentioned areas as to hold the bottom ends of said tubular supporting members against displacement and with their top ends exposed above said support when said members have been positioned on said support, positioning the platform member upon the top ends of said supporting member with those parts of the adhesive coatings of said areas outwardly of said areas engaged with the extremity of the top end of the associated supporting member and then bending the tongues of each set downwardly to enter the top end of the associated supporting member and then pressing said tongues outwardly into an adhesively united engagement with the internal surface of the associated supporting member.

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