

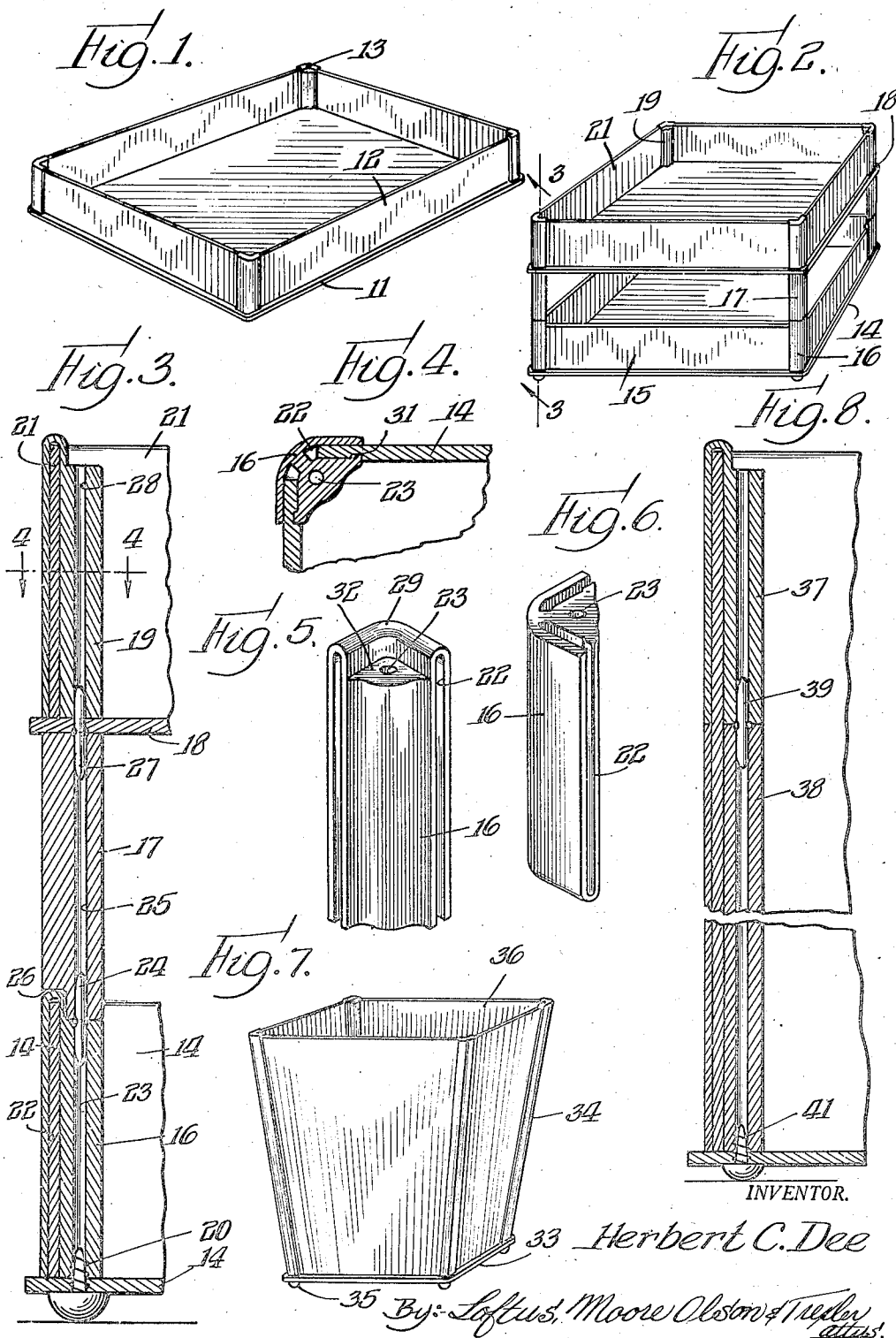
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TRAY STRUCTURE

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TRAY STRUCTURE

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The present invention relates to containers or boxes, and more particularly to a structure whereby containers or boxes may be fabricated so as to be shipped in knocked down form, and subsequently readily assembled.

Heretofore numerous attempts have been made to use sheet material commonly known as hardboard in the fabrication of various articles including boxes or containers. This hardboard material is formed of a plain dense, grainless, self-bonding ligno-cellulose fiber and is commonly available in sheet form from one-sixteenth to one-fourth inch thick. This material has numerous advantageous characteristics such as a smooth finish, resistance to moisture, resistance to chipping and abrasion, attractive appearance, light weight, adequate tensile strength etc. This material, however, is difficult to secure together at joints, particularly at the corners of a box or container since gluing or cementing requires considerable pressure and small nails or brads do not hold the material securely. In order to provide a suitable corner structure for boxes, trays, etc., made of this material, attempts have been made to provide corners of wood or metal. Wood corners have the disadvantage of not being resistant to moisture thus resulting in warping, and being subject to splintering. When wood corners are used, the box or container is not susceptible to being shipped in knocked down form. Metal corners have a disadvantage of marring or scratching other objects or furniture and of requiring special finish treatment.

To facilitate the use of such sheet materials as hardboard, plastic impregnated hardboard, or molded plastic sheet in the manufacture of boxes and containers such as jewel cases, cigarette and cigar boxes, powder boxes, letter trays, waste baskets, etc., where the attractive appearance and advantageous qualities of these materials are desired, there is needed a lock joint corner construction. Such lock joint corner construction must be easy to assemble. A lock joint corner device which is easy to assemble will also permit boxes and containers made of these materials to be shipped in knocked down form so as to conserve shipping and storage space. These objectives are attained in accordance with the present invention by providing for such articles an improved corner device and corner structure which locks and holds the walls of the article in proper position on a base. A minimum number of fastening means is provided to secure the base to the corner structure.

It, therefore, is an object of the present inven-

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tion to provide an improved structure for boxes or containers formed of sheet material.

Another object of the present invention is to provide an improved corner structure device for use in the manufacture or assembly of boxes or containers formed of sheet material such as hardboard and the like.

Another object of the present invention is to provide an improved box or container structure which can be shipped in knocked down form and which is relatively simple to assemble.

Still another object of the present invention is to provide an improved box or container structure for using materials which do not chip or splinter and yet are not hard or metallic, and which will require no exposed fastening or securing members.

A still further object of the present invention is to provide an improved molded plastic corner member for securing in position the walls and bottom of a box or container made of sheet material.

Other and further objects of the present invention subsequently will become apparent by reference to the following description taken in connection with the accompanying drawing wherein

Figure 1 is a perspective view of a box or tray constructed in accordance with the present invention;

Figure 2 is a perspective view of a double deck letter tray or file constructed in accordance with the present invention;

Figure 3 is a cross sectional view through one of the corners of the device shown in Figure 2 in the direction of the arrows along the line 3—3;

Figure 4 is a cross sectional view in the direction of the arrows along the line 4—4 of Figure 3;

Figure 5 is a perspective view of the corner device as seen from the inside of a box or container;

Figure 6 is another perspective view showing the sides and bottom of the device shown in Figure 5;

Figure 7 shows another form of structure permitted by the present invention such as a waste basket; and

Figure 8 is a cross sectional view through a corner structure of considerable height or length as in a box or container of the magnitude of the waste basket shown in Figure 7.

In accordance with the invention a box formed of sheet material such as hardboard or plastic is

shown in Figure 1 having a bottom 11, four side walls 12, and four corner members 13. The corner members 13 are so formed as to lockingly engage the end portions of each of the side walls 12, and each corner member 13 is secured to the bottom 11 by a fastening means passing upwardly through the bottom into the corner member. No cement, glue, nails, or other securing medium is used in the structure shown.

Another application of the invention shown in Figure 2 which may comprise a double decked letter tray having a lower tray formed of a bottom 14, four side walls 15, and four corner members 16. The four corner members 16 support four spacing members 17 upon which rests a bottom 18 of the upper tray. Four corner posts 19 secure in position the four side walls 21. The structure of the device shown in Figure 2 will be better understood by the cross-sectional view shown in Figure 3. The lower tray in Figure 2 is constructed in the same manner as is the tray or container box shown in Figure 1. From Figure 3 it will be seen that the corner post 16 has a channel portion 22 in which is positioned the end portion of a side wall 14. The corner post 16 has a longitudinally extending bore 23 which is arranged to receive a screw 20 which passes through a suitable aperture in the bottom 14. The screw 20 may be of the type having a resilient or rubber covered head. At the upper portion of the bore 23 there is mounted a connecting pin or member 24 which extends upwardly above the upper shoulder portion of the member 16 to engage a longitudinal bore 25 in the spacing member 17. The spacing member 17 has a shoulder-like portion 25 which is substantially complementary to the stepped upper portion of the corner post 16 of the lower tray. In the uppermost portion of the longitudinal bore 25, there is positioned another fastening pin 27 which extends upwardly through the bottom 18 of the upper tray into a bore 28 in the corner post 19 of the upper tray.

The particular manner in which the corner posts such as 13, 16, and 19 operate to retain in position the side walls and bottom of a tray or box assembly will be better understood by reference to Figures 4, 5, and 16. A corner post such as 16 has two channel portions 22 arranged at angles to each other as shown in Figure 4. Each of the channel like portions 22 extends from the bottom of the corner post to the top where the channel is closed by a rolled edge portion 29. Each channel 22 is provided at one of its sides with a tongue portion 31 arranged for cooperation with a groove or rabbet in the end portion of the wall member 14. Each of the end portions of the walls 14 is therefore formed so as to have a tongue and groove for cooperation with the tongue and channel of the corner post. The tongue and groove portion of the side wall is pushed upwardly into the corner post channel 22 so that further upward movement is not possible, and due to the tongue and groove arrangement of the side wall and the corner channel, it may be said that the double tongue and groove locking arrangement prevents any longitudinal motion of the side wall member. From Figure 5 it will be seen that the fillet portion 32 of the corner member 16 extends from the bottom upwardly to within a short distance of the top rolled edge 29 so as to leave a step portion. The step portion formed by the fillet 32 serves as a base for the lower end of a spacing member such as the member 17 shown in Figures 2 and 3, or as a stop for the four corner portions of a cover which

may be provided for a tray or box such as shown in Figure 1. Since a tray or box such as shown in Figure 1 requires four fastening members such as 24 which enter the corner posts from the bottom of the tray or box, it will readily be appreciated that the device may be left unassembled and shipped in compact form for subsequent assembly. The particular corner post construction utilized is simple to assemble and yet provides an unusually rigid secure corner structure. Preferably the corner members are formed of a molded plastic material of such color as to harmonize with or contrast pleasingly with the finish of the sheet material being used for the sides and bottom.

While the structure heretofore described is particularly adapted for containers and boxes such as letter trays, jewel cases, cigarette and cigar boxes and the like, this general type of corner structure is also adaptable for containers having much deeper side walls, as for example the waste basket shown in Figure 7. The waste basket shown in Figure 7 has a bottom to which is secured a plurality of corner post members 34 by a plurality of fastening members 35 which also serve as resilient supports for the waste basket. The side walls 36, generally trapezoidal in shape, are retained between the corner members 34. It will readily be appreciated that it might be difficult to mold a corner piece such as shown in Figures 4, 5, and 6 of such length as to extend the full length of the corner 34 shown in Figure 7. If such difficulty is encountered, a possible solution is illustrated in Figure 8 where, in the upper portion of the corner post comprises a short corner section 37 of a length commensurate to the pieces shown in Figures 5 and 6. The corner post 37 is secured to a corner post strip 38 which is similar in cross section but does not have the upper channel portion closed. The bores within the members 37 and 38 receive a securing pin 39 so as to provide a corner structure suitable for this purpose. The bottom of the container again is secured to the corner strip 38 by a single fastening means 41 in the manner heretofore illustrated in connection with the other boxes or containers.

From the foregoing it will be seen that there has been provided an improved corner structure and corner for interlockingly engaging the side walls of a box or container so as to facilitate the manufacture of such articles out of sheet material of a plain, dense, grainless, self-bonding substance or fibre including molded plastic sheet material and plain, dense, grainless hardboard of self-bonding ligno-cellulose fibre, either tempered or untempered and in various finishes as may be desired. Since the plastic corner structure does not require any securing means other than a single member which extends through the bottom into the bore in the corner in order to retain the article in assembled position, it will be appreciated that this corner device will make available boxes and containers constructed of such sheet materials which have heretofore not been susceptible to convenient construction and which, however, may have highly desirable characteristics, as mentioned earlier in this description.

While for the purpose of illustrating and describing the present invention, certain specific preferred embodiments have been shown in the drawing, it is to be understood that the invention is not to be limited thereby since obviously such variations and other embodiments are con-

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templated as may be commensurate with the scope of the invention as defined in the appended claims.

This invention is hereby claimed as follows:

1. A multidecked letter tray comprising a plurality of trays each having a base and four side walls interconnected by corner members, each corner member having a generally triangular cross section and two longitudinal grooves arranged at angles to each other, each groove adjacent one side having a projecting tongue portion adapted to cooperate with a complementary groove in the side wall, each groove of the corner member being closed adjacent its upper end, each side wall having adjacent each end a tongue and groove for complementary cooperation with a groove and tongue of said corner, each base being secured to its associated corner members by fastening means extending through the base from the bottom thereof into longitudinal bore portions in the corner members, and spacing members mounted between the top of the corner of the lower tray and the bottom of the upper tray, said spacing members each being provided with a longitudinal bore for receiving fastening means to retain said spacing member in position.

2. A corner for interlockingly engaging the individual side walls of a container to hold said side walls fixed relative to each other and to the bottom of the container comprising an elongated member having a generally triangular cross-section and two longitudinal grooves arranged at right angles to each other, each groove being closed at one end to prevent upward movement of the side walls and having adjacent its outer edge a longitudinally extending tongue adapted to fit into a complementary groove extending transversely adjacent the end of the side walls of the container, said corner having an inner portion of reduced length provided with a longitudinal bore for receiving at its bottom end a fastening screw passing through the bottom of the container to secure said corner and said side walls in position relative to the bottom of the container.

3. A container comprising a base and four side walls each formed of dense, grainless, self-bonding ligno-cellulose hardboard, a plurality of molded plastic corner member for interlockingly engaging the side walls of said container, each corner comprising a vertical member having two vertical channels arranged at right angles to each other, each channel being closed at its upper end and having on the inner side wall of the channel at the outer edge thereof a projecting tongue portion, each container side wall having rabbeted

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ends for complementary cooperation with the corner member channel and its projection, each corner member having a fillet portion facing the interior of the corner and being provided with a vertical bore extending longitudinally there through, each fillet portion being of lesser height than the remainder of the corner, and fastening members extending through said base from the bottom thereof into said bore for retaining said side walls in said corners and fixed relative to said bottom.

4. An assembled container comprising a base and side walls formed of dense, grainless, self-bonding, ligno-cellulose hardboard, said side walls being of lesser length than the dimensions of said base, the end portions of the side walls each being rabbeted to form a tongue and groove portion, a plurality of molded plastic corner members each having two longitudinal channels arranged at substantially right angles to each other, each channel having on the inner side wall thereof at the outer edge of the channel a longitudinally extending tongue for complementary cooperation with the tongue and groove portion of the rabbeted ends of said side walls to prevent longitudinal movement thereof, each corner having a portion of reduced length and of generally triangular cross-section with the hypotenuse located toward the interior of the container and having therein a longitudinal bore for receiving fastening members, each corner having a portion extending above the said side wall and being provided with a closure for the upper portion of the channel to limit vertical movement of the side walls of said container, and fastening means extending through the base of said container into said bore for securing said base and said side walls in rigid assembled relation to each other.

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