

Oct. 1, 1957

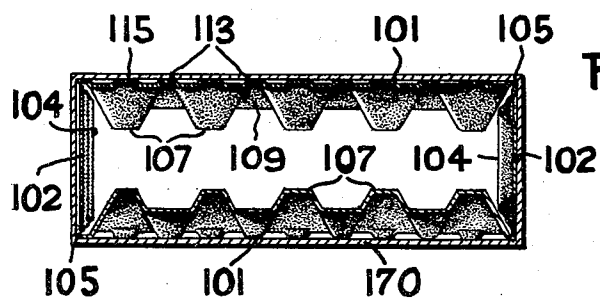
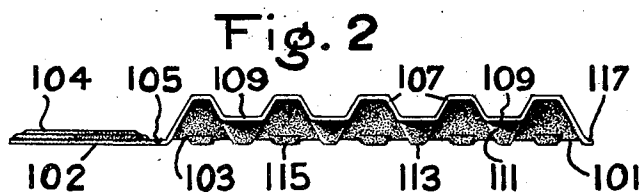
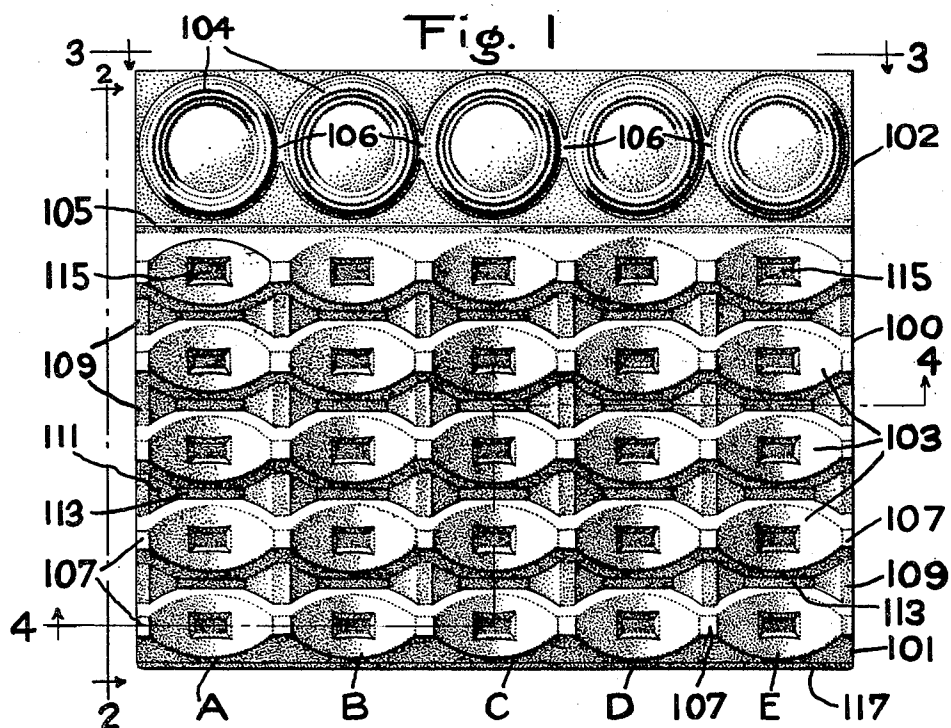
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2,808,189

PACKING MATERIAL FOR FRAGILE ARTICLES

Filed Nov. 16, 1953

3 Sheets-Sheet 1



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Fig. 4

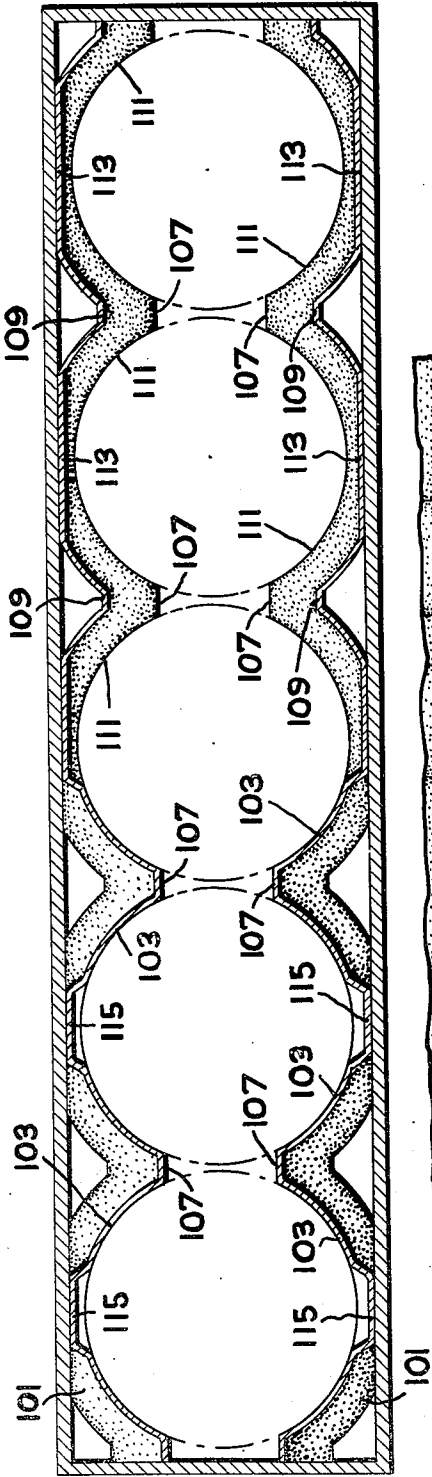


Fig. 7A

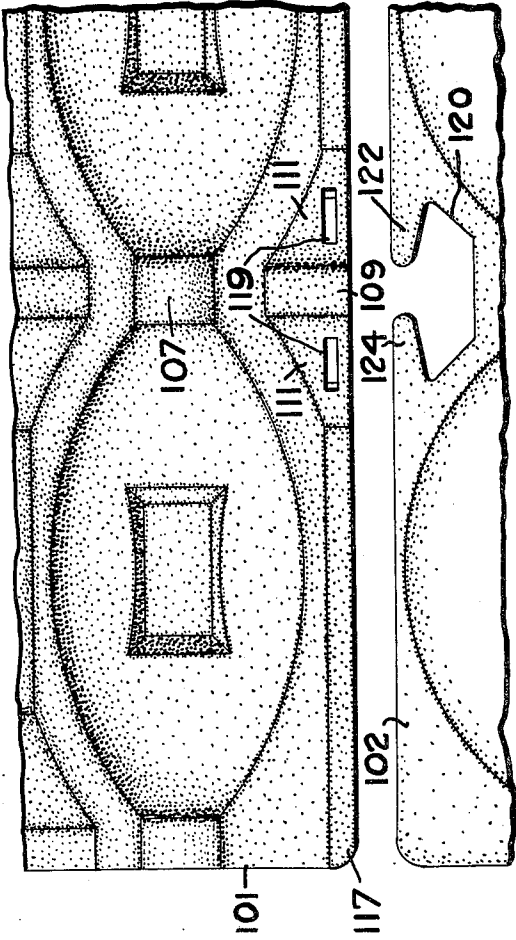


Fig. 7B

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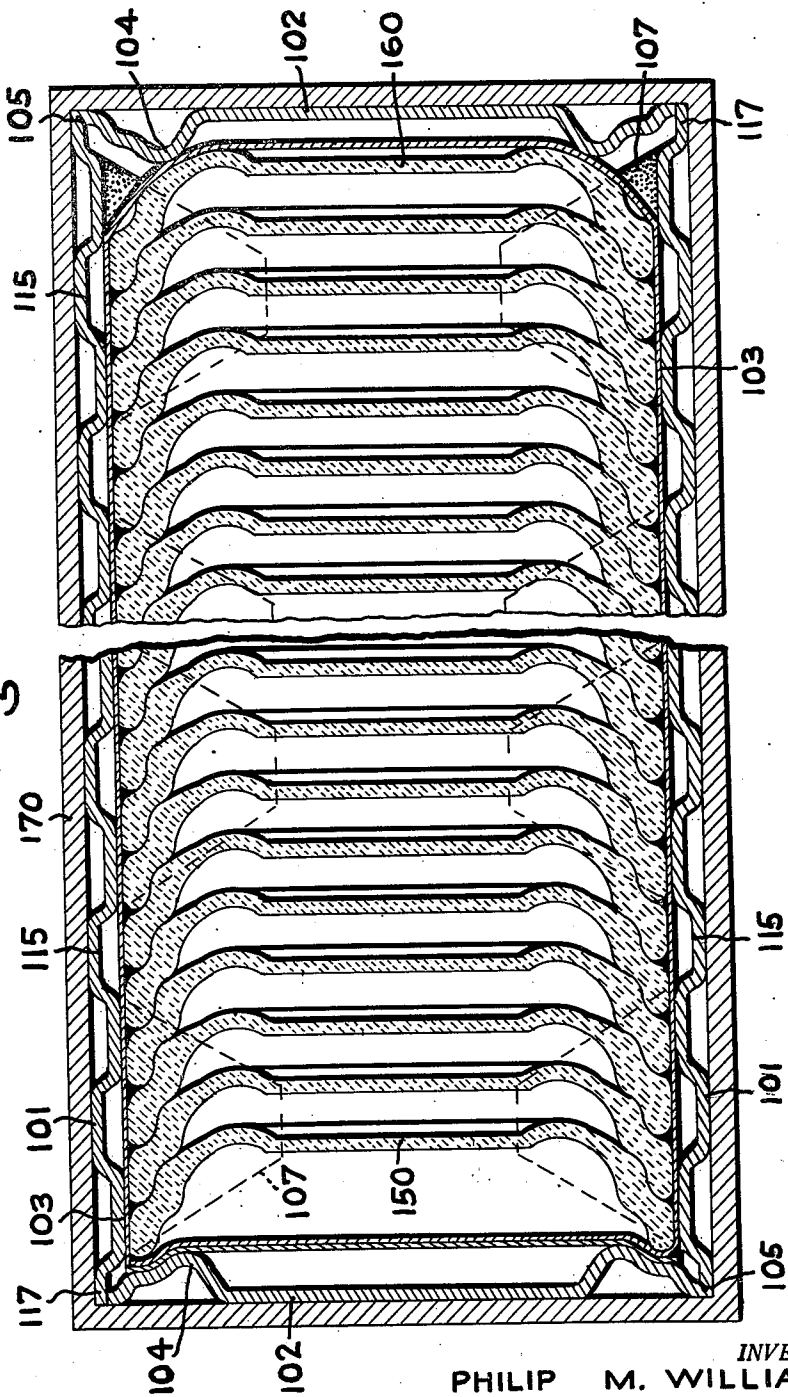
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Fig. 6



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PACKING MATERIAL FOR FRAGILE ARTICLES

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Application November 16, 1953, Serial No. 392,240

5 Claims. (Cl. 229—14)

This invention relates to packing material for protecting a plurality of closely packed fragile articles. More particularly, the invention relates to a means for securely packing and protecting shipments of a plurality of disc-like fragile articles against damage during transit and handling. Specifically, the invention relates to a novel packing flat arrangement comprising two identical flat members which are adapted to resiliently support and protect a plurality of closely packed clay pigeon targets.

For the purpose of this application, I shall restrict my discussion of the invention in connection with the shipment of clay pigeon targets, but it will be understood that this disclosure is merely illustrative, and should not be construed as limiting the scope of the invention. In particular, it should be noted that the present invention is applicable to the packaging of a wide variety of disclike fragile articles, as for example, saucers, dishes, bowls and cups. It will further be understood that the packing flat of the invention is applicable to fragile, cylindrical articles, such as short fluorescent tubes, glass vases, lighting tubes, glass rods, and steel tubes of thin gauge. A main object of the present invention is to provide an inexpensive and convenient-to-use packing material for safely packing a number of clay pigeon targets, or the like, in a self-contained compact package. In particular, it is an object of the present invention to provide such type packing arrangement which will serve to simplify handling during the packing operation, accommodate and facilitate handling of the packages during conditioning for transportation, as for example, packing in a shipping case, and present a pleasing and attractive appearance upon uncrating from a shipping case without requiring further handling. Other objects and advantages will appear from the description and claims which follow.

In attaining the objects of my invention, I generally construct my packing material in the form of sheets of rectangular extent, and preferably of slightly greater width than length. Each sheet comprises a packing flat and includes a marginal or end area supporting a plurality of side-by-side abutment formations defining a limit position for a plurality of stacks or tiers of clay pigeon targets. The marginal area includes means hingedly connecting it with the main supporting area on the sheet for the purpose of permitting bending or flexing of the marginal area upward from out of the plane of the sheet to a right-angled relationship with the supporting area in which position the abutment formations define limit stops for a plurality of aligned parallel rows of clay pigeon targets which may rest upon the main supporting area. The surface of the main supporting area is contoured so as to provide a plurality of adjacent rows of axially aligned half-moon seating depressions for a purpose hereinafter apparent. Each of the rows is separated one from another by means of a series of raised posts vertically rising from the surface of the sheet at the terminal ends of the half-moon depressions. The surface formations on the sheet are such that a plurality of stacked or tiered clay pigeon targets may be placed with their peripheries in

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contact with the half-moon depressions in a single row with the leading or top target in flush engagement with the abutment bearing marginal area. Like tiers or stacks of targets may then be placed in the adjacent rows of half-moon depressions.

Thereafter, an identical packing flat may be placed, in inverted relationship, over the exposed upper peripheries of the supported targets with the marginal end area of this second flat being reversed 180° from the marginal area of the lower flat. Subsequently, the superposed packing flats with the interposed and supported rows of targets may be firmly bound in a permanent union by means of any suitable wrapping material, as for example, sheet cellophane. Alternatively, the overlapped flats may be inserted, endwise, into an open ended tubular carton.

As a result of this construction, the several rows of stacked targets become frictionally gripped within the confines of the respective packing flat members due to the surrounding wrapping or carton walls with the result that the strains and stresses encountered during shipment and handling become transmitted to each of the rows of stacked targets to react on each row as an integrated unit as distinguished from individual targets. It will be readily recognized that the provision of means for uniformly distributing stresses and strains so as to prevent the concentration of the same upon any individual target greatly eliminates the chances of breaking or cracking the supported targets.

Having broadly disclosed the invention, reference will now be made to the drawing describing a specific embodiment thereof and in which:

Fig. 1 is a top plan view of the packing flat of the invention;

Fig. 2 is a side elevation view of the packing flat along the lines 2—2 of Fig. 1;

Fig. 3 is a side elevation view along the lines 3—3 of Fig. 1;

Fig. 4 is a sectional view of a package embodying the invention, this package including a pair of packing flats reversed to each other, the section being taken on a line corresponding to line 4—4 of Fig. 1;

Fig. 5 is a sectional view of a pair of cooperative packing flats in assembled relationship in a supporting casing;

Fig. 6 is a sectional view of a pair of packing flats assembled about a stack of clay pigeon targets, and

Figs. 7a and 7b are fragmentary plan views of a modified form of the invention.

A preferred form of packing flat according to the invention is illustrated in Figs. 1 through 6, inclusive, of the drawings and includes a substantially plane sheet of pulp molded fiber material which is advantageously formed through accretion of pulp fibers by suction molding the same from a pulp slurry onto a foraminous die. The forming operation is a well-known one and preferably proceeds in a manner similar to that set forth in the patent to E. L. Shepard 2,585,049 issued February 12, 1952. As will be seen from an inspection of Figs. 1 and 2, the pulp molded sheet comprises a first main supporting area or floor section 101 and an adjacent integral marginal area or end wall section 102, the sections being joined together by a recessed line 105. Line 105 is preferably suction molded into the integrated sheet during the formative operations by provision of a suitable die formation and comprises a molded fold line facilitating the ready bending of section 102 from out of the horizontal molded condition to an upright vertical position at approximately 90° to the support or floor section 101.

The end wall section 102 includes a plurality of raised annular abutment structures 104 for a purpose hereinafter apparent. Each abutment structure comprises a series of ringlike ridges defining a craterlike formation

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having a central floor surrounded by concentric annular ribs. Preferably, as shown in Fig. 1, the annular abutment structures are integrally joined as at 106 in contiguous side-by-side relationship. In the present form of the invention, the abutments 104 comprise five in number and are adapted to function as terminal stops or arresting rings upon the folding of section 102 at right angles to section 101, and in which position rings 104 will be oriented to contact the leading one of each series of separate rows of tiered disclike clay pigeon targets supported by floor section 101.

The supporting or floor section 101 is arranged to provide a plurality of adjacent seating rows equal in number to the ringlike abutments 104 for the purpose of receiving and separately supporting stacked arrays of the disclike clay pigeon targets. As shown in the drawings, section 101 presents the target supporting rows in the form of a plurality of aligned, but axially spaced, half-moon, seating impressions 103 which have a generally hemispherical contour as best seen in Figure 4 of the drawings. The arrangement is such that the half-moon cavities present a wavelike appearance to the support section in a transverse direction while presenting a plurality of independent seating and cushioning areas oriented into aligned rows longitudinally of the support section. The individual half-moon cavities are separated one from another by deeper cavities of relatively smaller extent formed by a pair of opposed, downwardly sloping cavity walls 111 which terminate in a central flat floor 113. Each half-moon depression further includes a recessed, rectangular pocket 115 having a floor line lying in the plane of the flat floors 113. The arrangement is such that the deep cavities 111, 113 and recessed pockets 115 provide spaced supporting areas both longitudinally and transversely of the support section 101 for independently suspending the several rows of stacked clay pigeon targets carried in the individual longitudinal rows of half-moon depressions.

Each row of half-moon seating impressions is integrally united with adjacent rows by means of vertical posts 107 forming terminuses of the respective half-moon depressions, the separate post in each row being integrally connected in axial alignment with adjacent posts by means of half-posts 109 constituting the terminuses of the deeper cavities 111, 113. The present construction results in a plurality of independently sprung, seating depressions 103 which are supported above the base line of the support section in such manner as to permit vertical and lateral flexure to a limited degree. It will further be apparent that the alternating alignment of full and half-posts, 107 and 109, respectively, provides a stiffening and stabilizing action obviating the usual lack of rigidity in large section molded pulp fiber packing flats.

One of the unique features of the present packing flat construction is the obtaining of this substantial rigidity without sacrificing the flexibility of the support or its cushioning action in absorbing impacts, strains and stresses. Due to the unusual contoured formation of the flats, the rows of stacked targets are suspended independently of each other with the individual targets being packed compactly together so as to translate as a unit. This permits shocks and strains to become distributed evenly over the entire series of half-moon, seating depressions in a given row and provides a much greater degree of protection than heretofore provided due to the elimination of clashing between the individual targets.

In packing the clay pigeon targets according to the present invention, a pair of identical packing flats, formed in the manner illustrated in Figs. 1 through 3 inclusive of the drawings, are placed beneath and above a plurality of adjacent rows of stacked or tiered clay pigeon targets, for supporting the same in an integrated manner in a single package. Preferably, the packing of the clay pigeon targets proceeds by placing a series of stacked or

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tiered targets which may be wrapped in any suitable covering, as for example, a cellophane envelope, in each of the supporting rows A, B, C, etc., of one packing flat with the ends of the wrapped tiers or stacks positioned to lie in the region of the molded fold line 105 and a terminal margin 117 at the opposite end of supporting section 101. With the targets thus positioned, end wall section 102 is then folded vertically upwardly to bring the abutment ring structure 104 into endwise face engagement against the leading faces of the rows of supported targets.

Thereafter, an identical packing flat member is positioned over the upper surfaces of the targets, but oriented at 180° from the lower packing flat while also being inverted, to bring the half-moon depressions into surface engagement with the peripheries of the several rows of targets in the manner illustrated in Figs. 5 and 6 of the drawings. When so positioned, the end wall section of the uppermost packing flat may then be folded vertically downwardly towards the terminal margin 117 of the lower packing flat and into frictional abutting relationship therewith. Preferably, the end wall sections of the respective flats are deformed slightly by pressing the same into tight abutting relationship against the leading and trailing targets 150 and 160 of the individual target stacks. This assures the obtaining of a very tight pack and permits the ring-lock abutment 104 to flex slightly with a consequent take-up of any looseness or play in the wrapped stack of targets in each row.

If desired, the mating ends of the respective packing flat members may be locked or sealed together as by means of Scotch tape, or the like. Alternatively, the terminal end 117 on the respective flats may also be connected with section 101 by means of a molded flat line identical to fold line 105 whereby the marginal end may be turned from the plane of the supporting section to lock behind the underside of the respective end wall section 102 to positively assure a tight frictional fit between the respective end wall sections 102 and the leading and trailing targets of each row. In such case Scotch tape or other adhesive binding means may be applied to hold the marginal edge in locking engagement with the end wall section.

According to a preferred form of the invention, however, it is not necessary to employ any independent locking or sealing structure in conjunction with the overlapping packing flats. Preferably, as shown more clearly in Fig. 6 of the drawings, the loaded packing flat members are adapted to be inserted into a rectangular, open ended carton 170, which will serve to retain the overlapped flat members in their preflexed, tight fitting relationship. It will be appreciated that the combination of an external carton structure in combination with the undulated supporting formations of the overlap packing folds serves to support and protect the plurality of rows of fragile targets against all of the rigors of handling normally encountered in commercial transportation.

In this respect it will be particularly noted from an inspection of Fig. 6 that the spaced bearing supports afforded by recessed pockets 115 and cavity floor surfaces 113, as reinforced by carton 170, result in a cushioning action heretofore unavailable in the packing of a plurality of small disc-like elements without requiring individual wrapping or cushioning means. This action is in effect supplemental to that provided by the half-moon depressions 103 and results in the obtaining of a duplex suspension in which vibrations transmitted to any one section or portion of the tightly packed rows of targets will be quickly damped without permitting the independent flexing or shifting of individual targets. In this respect an inspection of Fig. 6 will show that the individual target elements in any row remain supported in an integrated and united fashion, with spaced bearing areas at discreet intervals along the length of the rows being provided by the floor surfaces of the half-moon

depressions 103. It is believed to be obvious that an unribbed and relatively inexpensive carton such as that of 170, as utilized in the present arrangement, could not be availed of to provide a simplified sealing and cushioning arrangement in the absence of the particular packing flat construction of the present invention. Preferably, the cartons 170 are formed from conventional light-weight cardboard and are adapted to support two groups of overlapped packing flat packages in side-by-side relationship.

It is not necessary to employ separate external wrapping means and for this purpose the separate packing flats may include means providing an interlocking function for securing two superposed flat members together in fixed and permanent sealing relationship. In its simple form, such locking means can comprise a plurality of tab members integrally extended from the free end of the end wall section 102 with appropriate cooperating slots being provided in the opposite free end 117 section 101. With such an arrangement, the tab members on one packing flat will be adapted to be inserted through and locked in the slots in the opposite terminal end of the companion flat member. A preferred form of such locking tab arrangement is illustrated in Figs. 7A and 7B of the drawings in which the respective sections of each packing flat includes means forming the locking tabs and the locking slots in such manner that the same will become automatically interlocked upon positioning the packing flats in the relationship illustrated in Figures 5 and 6 of the drawings. According to this form of the invention, the free terminal end of section 101 of the packing flat includes a pair of additional half-posts 109 extending to the edge surface of margin area 117 in an alignment with the second and fifth series of full and half-posts longitudinally of section 101. These additional half-posts include sloping side walls 111 which merge with the marginal floor 117 in a manner identical to the merging of side walls 111 with floor cavities 113 in the main body of the section and present a pair of opposed slots 119 in alignment with the marginal rim 117. At the other end of the packing flat, end wall 102 is cut away in the manner illustrated at 120 to present a pair of opposed locking tabs 122 and 124. The cut-away areas 120 are located between the first and second and fourth and fifth abutment rings on the end wall section in order that each cut-away area will be aligned with the extra raised half-posts 109 at the marginal end of section 101. With the above construction it will be readily understood that the folding of the end wall section with respect to the support section in the manner shown in Figure 5 will present the locking tabs 122 and 124 of each wall section in directly opposed relationship to the slotted terminal half-posts 109 at the marginal trailing end of the other packing flat in such manner that tabs 122 and 124 will enter slots 119 to lock the respective flat members together in a permanent union. It will further be appreciated that the locking action may be obtained through the simple expedient of pressing the respective flat members into tight, compact engagement about the interposed rows of targets without requiring any independent handling of the individual tab and slot means.

If desired, the integrated packages formed by the overlapped and interlocked flat members may then be wrapped in a suitable paper, as for example, cellophane, in preparation for shipment to retailers, which cellophane-wrapped

package is ready for display and sale immediately upon uncrating without requiring additional handling. In such case, the open sided condition of the packages permits the ready inspection of the target contents without requiring unwrapping (see Fig. 4).

As many apparently widely different embodiments of my invention may be made without departing from the spirit and scope hereof, it is to be understood that my invention is not limited to the specific embodiments hereof except as defined in the appended claims.

What is claimed is:

1. A packaging arrangement comprising a generally tubular carton, a pair of packing flats positioned in said carton and each including an end wall section and a floored supporting section, said end wall section being oriented to extend at 90° with respect to said floored supporting section, said respective flat members being inverted and rotated at 180° with respect to each other to define a contiguous tubular contour within the confines of said tubular carton, each said end wall section supporting a series of annular abutment rings integrally formed therein, and each said floored supporting section comprising a plurality of half-moon depressions oriented in spaced, axially aligned relationship in side-by-side rows with each row being in axial alignment with an abutment ring, said rows of half-moon depressions being integrally connected one with the other by a series of aligned, alternate full- and half-post members.

2. A packing arrangement as set forth in claim 1 in which said respective rows of half-moon depressions include recessed support cavities defined by sloping side-walls integrally depending from adjacent depressions.

3. A packaging arrangement as set forth in claim 1 in which said each half-moon depression includes a recessed cavity defining a supporting pocket centrally of the depression.

4. A molded pulp packing flat comprising a generally rectangular, flat sheet having two hinged sections, one of said sections having a plurality of parallel rows of half-moon depressions, each of said depressions being of substantially the same size and shape and situated in a common plane, the depressions in each row being separated from each other by cavities extending below said depressions and from the transversely adjacent depressions in the other rows by vertical posts, said posts being arranged in rows parallel to the rows of depressions and the posts in each row being separated from each other by half-posts, said half-posts also being arranged to separate the transversely adjacent cavities from each other, and the other of said sections having a series of annular abutment rings integrally formed therein, each abutment ring being in axial alignment with a row of depressions.

5. The packing flat of claim 4 wherein each depression is provided with a centrally-positioned recess.

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