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W. W. HOOPER ET AL

2,946,500

MERCHANDISE RACK AND METHOD OF FORMING

Original Filed Oct. 9, 1953

Fig. 1

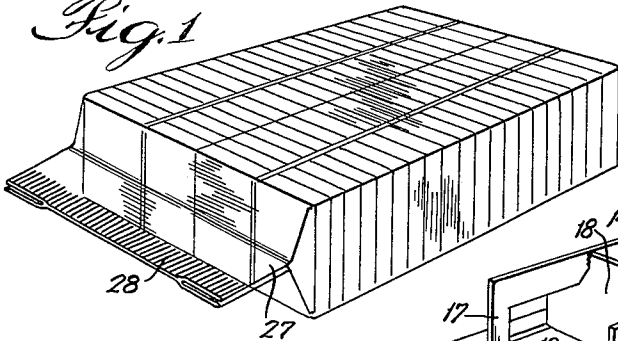


Fig. 2

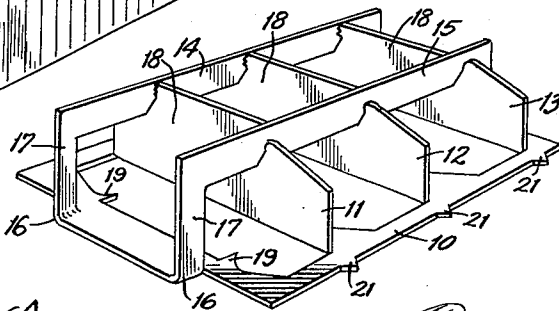


Fig. 3

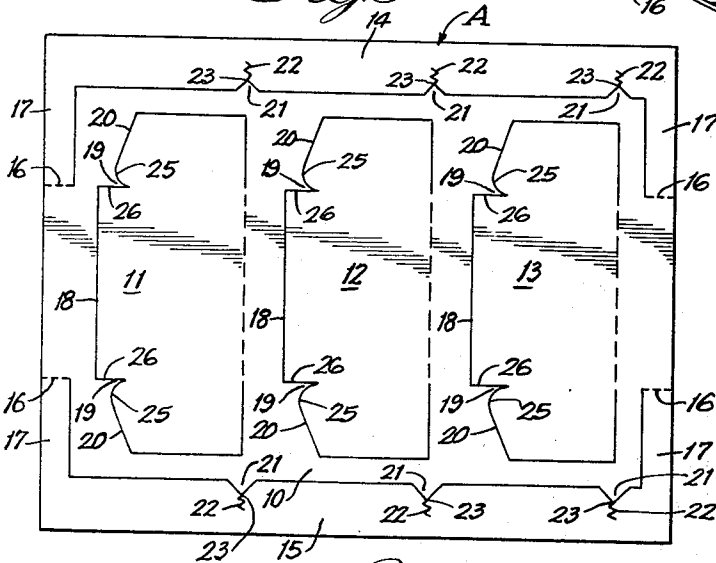


Fig. 5

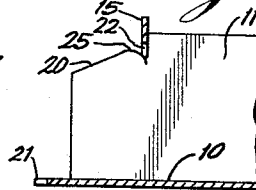


Fig. 6

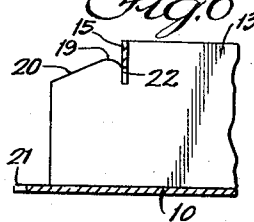
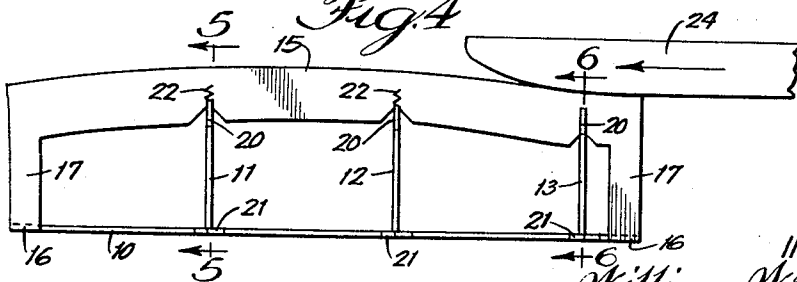


Fig. 4



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MERCHANDISE RACK AND METHOD OF FORMING

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Substituted for abandoned application Ser. No. 385,129, Oct. 9, 1953. This application Oct. 29, 1958, Ser. No. 770,425

2 Claims. (Cl. 229—42)

This invention relates to a merchandise rack and method of forming the same.

This application is a substitute for our abandoned application, Serial No. 385,129, filed October 9, 1953.

Merchandise racks or cardboard partitioned boxes are commonly used for supporting fragile bakery and confectionery products such as cookies, wafers, chocolate cherries, etc. It is common to package such delicate products in the partitioned racks or frames and then to enclose the entire package in a plastic bag so that a self-sustaining and stackable package is produced.

The problem in making these racks is to provide one which can be readily assembled with a minimum of labor and so that the assembled package is locked against collapsing and while at the same time providing at the top of the package, as well as at the bottom, supporting surfaces or edges which will carry the weight of packages placed thereon for shipping, storing, etc.

It is possible to produce a very sturdy satisfactory compartment rack by employing a bottom member with vertically-extending panels provided with slots and to interlock with these separate removable panels having slots which interlock with the slots of the base member. Such a structure is shown in Deline Patent 2,587,706. The advantage of this structure is that the partition members are interlocked by their engaging notches so that the partitions cannot move relatively with respect to each other in case of sudden stoppage of the car or carrying vehicle or the dropping of the package, etc. While the product is this satisfactory, the difficulty is that such boxes do not retain the loose partitions or panels against removal, and further the latter panels have to be placed in position through a vertical movement by hand. Because of the expense involved in labor and because the finished final product contains loose partitions, efforts have been made to form boxes or racks from a single blank so that the longitudinal and transverse panels are both held against the base member and are not removable. Such a structure is illustrated in Watson, et al. Patent 2,584,967, of February 5, 1952. The difficulty with the Watson structure, however, is that the transverse partitions, while being held against movement in one direction, in the final erected form are not held against movement in the other direction. To meet this problem, Watson employs serrations in the form of teeth which are utilized to make collapsing more difficult, but the paper teeth thus formed cannot be relied upon to support the goods against loads directed against the panels when the package is dropped or the carrying vehicle suddenly stops, etc.

An object of the present invention is to provide a novel process or method wherein the merchandise rack can be erected from a single pre-cut blank so that transverse and longitudinal panels cooperate in the assembly operation to bring notches therein into alignment and to interlock the parts by a simple vertical pressing movement. Another object is to provide an integral merchandise rack in which the transverse and longitudinal partitions have

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interlocking notches which positively limit the partitions against collapse in either direction under impacts of the character described above. Yet another object is to provide a merchandise rack in which the transverse and longitudinal partitions are so interlocked that they cannot be separated without destruction of the rack itself. A still further object is to provide a method for assembly of transverse and longitudinal partitions in an integral rack in which the topmost partitions serve as a means for guiding the notches of the partitions into engagement so that the final interlocking of the partitions can be accomplished by a simple ironing movement.

A further object is to provide a unitary die-cut blank having panels therein so proportioned that when longitudinal panels thereof are swung to a vertical position and transverse panels therein are swung to a transverse position, the longitudinal panels are bowed upwardly and bear against the transverse panels so as to form a quick interlock of cooperating notches in the panels. Yet another object is to provide in a merchandise rack formed from a unitary or integral blank, longitudinal panels having their lower ends forming a rounded connection with the base to provide a yielding panel for engagement with transverse panels when the transverse panels are being erected. A still further object is to provide a method and means whereby an integral merchandise rack can be formed rapidly through the use of machine or manual parts by the manipulation of panels in which the panels cooperate in effecting the quick interlocking of notches therein. Other specific objects and advantages of the invention will appear as the specification proceeds.

The invention is shown, in an illustrative embodiment, by the accompanying drawing, in which—

Figure 1 is a perspective view of a finished package in which an article-supporting rack is enclosed within a transparent bag; Fig. 2, a perspective view of the assembled rack, free of merchandise; Fig. 3, a top plan view of a sheet blank shown after the die-cutting operation and preparatory to the assembly of the rack; Fig. 4, a view showing the parts in proportioned relationship and at a stage in which the transverse panels have bowed the longitudinal panels upwardly, said figure also showing a pressure element pressing one of the transverse panels into interlocking engagement with a longitudinal panel; Fig. 5, a sectional detail view, the section being taken as indicated at line 5—5 of Fig. 4; and Fig. 6, a sectional detail view, the section being taken as indicated at line 6—6 of Fig. 4.

In the illustration given, A designates a blank of cardboard or other suitable material employed for the forming of a merchandise rack. Such a blank is shown in Fig. 3. The blank is die-cut at the points shown in solid lines, and the parts are adapted to be folded along the dotted lines. The assembled or erected structure is shown in Fig. 2. In this structure, there is a base portion 10 adapted to form the bottom of the rack. From the base extend upwardly transverse partitions or panels 11, 12 and 13. Also extending from the base are the longitudinal partitions or panels 14 and 15. The partitions 14 and 15 preferably connect to the base 10 along rounded or loop connections 16 which allow the panels 14 and 15 to yield resiliently in a vertical plane. The panels 14 and 15 each have depending legs 17 which join the base, as stated above, through the resilient connections 16.

As shown best in Fig. 3, the partitions 11, 12 and 13 each have a central load-supporting top portion 18, and at the ends thereof are slits 19 which are employed to form the interlock which will be later described. The outer ends of each partition 11, 12 and 13 may be flush with the top surface 18, or may be tapered, as indicated at 20.

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The longitudinal panels 14 and 15 are each provided with notches 21, and each of the notches 21 preferably continues as a zigzag slit 22. If desired, the notches 19 and 21 of the transverse and longitudinal panels may be ordinary simple notches or slits which, when pressed together, will form an interlock that will prevent the panels from being separated. We prefer, however, the form of notches or slits illustrated, because the parts can be quickly brought together, centered, and pressed into interlocking engagement in a minimum of time during machine assembly.

The rack can be erected in different steps by machine or manual operation. We prefer, however, to employ means for swinging the longitudinal panels 14 and 15 vertically to the position shown in Fig. 2 as the initial step, while machine or manual fingers then move the transverse partitions 11, 12 and 13 vertically with the lower portion of the notched portions 19 engaging the upper edge of the partitions 14 and 15 so as to bow them upwardly. Further, in this operation, the resilient connections 16 yield so that when the partitions 11, 12 and 13 reach substantially the vertical position shown in Fig. 4, the lower notched portion 19 bears against the upper portion 23 of the notch 21, as illustrated in Figs. 4 and 5. An ironing element 24 then presses the top members 14 and 15 downwardly, as illustrated at the right-hand side of Fig. 4, so as to bring the transverse partitions into a completely interlocked arrangement.

In the final structure, the notches 19 mesh with the notches 21, and in addition the zigzag slits 22 receive the uncut portion of the corresponding transverse partition. As a result, the composite slits or slots of a longitudinal partition wall 14 or 15 are completely interlocked with the slot or slit of the corresponding transverse partition wall 11, 12 or 13. In Fig. 5, the transverse partition 11 is bearing against the bowed longitudinal partition 15, and when the partition 15 is pressed downwardly, not only is there an interlock between the notches 19 and 21, but also the slit 22 receives the uncut portion of the partition 13 below the notch 19 thereof.

The result of the structure shown in Fig. 6 is that the transverse panels are interlocked by notches with the longitudinal panels so that neither can move or be separated without destruction of the rack. The vertical legs 17 hold the longitudinal panels 14 and 15 downwardly into tight engagement with the transverse panels 11, 12 and 13, and the transverse panels 11, 12 and 13, by their interlock with the longitudinal panels, prevent the longitudinal panels from moving laterally. Thus, a compact structure is provided in which transverse and longitudinal panels, held in engagement by their connections with an integral base, are united by interlocking notches or slits that positively prevent relative movement of the panels.

In the operation of assembly, the longitudinal panels 14 and 15 serve an important function in that they press downwardly against the transverse panels, and as a result of the bowing action illustrated in Fig. 4, the longitudinal panels snap quickly into the notches of the transverse panels, and vice versa, to form the interlock illustrated in Fig. 4. By reason of the tension exerted upon the parts in the bowed relationship, the engagement of the notches is instantaneous when they reach alignment, and the parts are held firmly in position for the ensuing ironing operation. In the ironing operation, the member 24 may be moved across the longitudinal panels 14 and 15 to form the final interlock, or, if desired, the partially assembled rack, as shown in Fig. 4, may be moved by a conveyor under the ironing member 24 to effect the final interlock.

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In the assembly operation, any irregularities in the cardboard, due to warping, etc., are overcome by the alignment features provided in the die-cut blank itself. The cam shoulders 25 of the notch 19 guide the transverse panels or beams 14 or 15 into the notch 19, while the vertical side walls 26 serve to support the sides of the panels 14 and 15 in the assembly operation, and particularly in the pressing operation illustrated in Fig. 4. The resilient bowed condition of the panels 14 and 15 serves automatically to move the longitudinal panels into the center of the slots 19 and into alignment with side walls 26 so that, as the ironing member 24 engages the bowed members 14 and 15, they move surely into the interlocked position shown in Fig. 6.

In the operation of the longitudinal beams 14 and 15, it is found that the slits or slots therein give flexibility to these cardboard parts so that they can readily bow as illustrated in Fig. 4, while at the same time, when these members are pressed down into the final interlocking position, they tie the transverse partitions rigidly against movement so that under sudden stoppages or impacts there is no relative movement or slipping of the panels.

After the merchandise rack has been erected and the same has been filled with goods, the entire package may be enclosed within a plastic bag 27 and sealed as indicated in Fig. 1 at 28.

While, in the foregoing specification, we have set forth a specific structure in considerable detail for the purpose of illustrating the invention, it will be understood that such details of structure and of process may be varied widely by those skilled in the art without departing from the spirit of our invention.

We claim:

1. A merchandise rack comprising a transverse bottom panel having longitudinally extending side portions and transversely extending end portions defining a continuous peripheral framework, said bottom panel also having a plurality of transversely extending intermediate portions equally spaced from each other and from the end portions and having their ends integral with said side portions, transverse vertical panels upstanding from one side of all said intermediate portions and one of said end portions, vertical legs integral with said end portions, vertically arranged longitudinal beam panels spaced above said bottom panel, said longitudinal beam panels being connected to the bottom panel only by said vertical legs, downwardly extending notches along the top edges of said transverse vertical panels, said downwardly extending notches including a vertical edge and an arcuate edge merging to define a sharp pointed bottom, upwardly extending notches along the bottom edges of said longitudinal beam panels aligning with the notches of said transverse vertical panels, and slits in said longitudinal beam panels extending upwardly from the notches in said longitudinal beam panels and engaging the transverse vertical panels, the upper edges of said transverse vertical panels and said longitudinal beam panels being coplanar.
2. The structure of claim 1, wherein said slits are zigzag.

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