Aug. 22, 1933. H. PALAIS 1,923,881

SHEET MATERIAL ARTICLE AND METHOD OF MAKING THE SAME

Filed Nov. 11, 1930 3 Sheets-Sheet 1

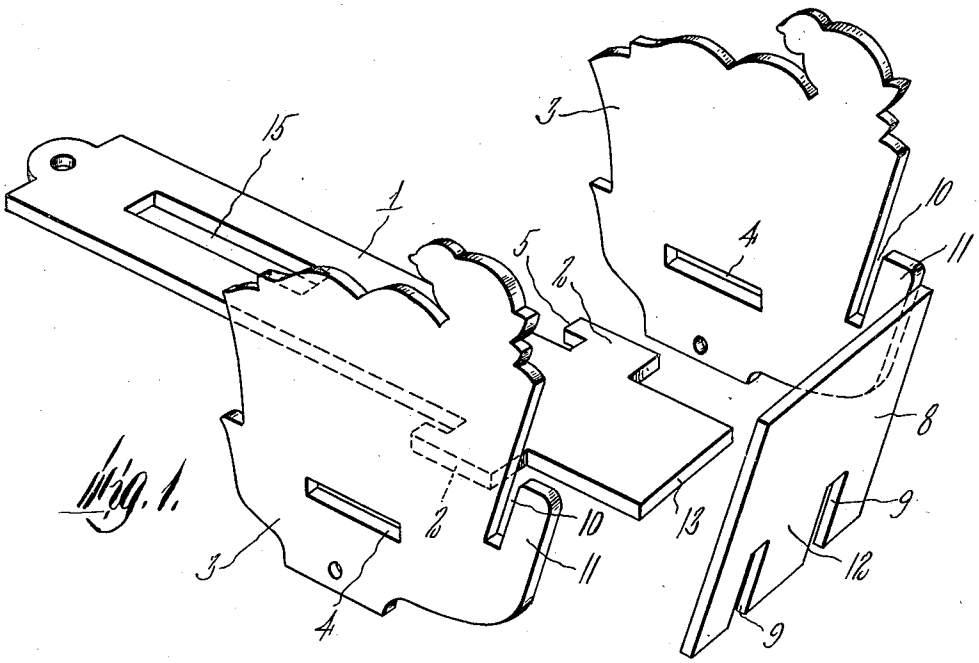


Fig. 1.

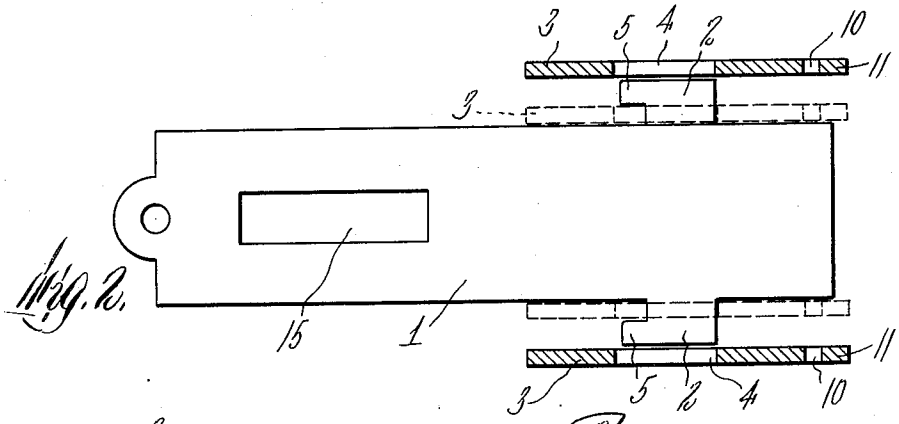


Fig. 2.

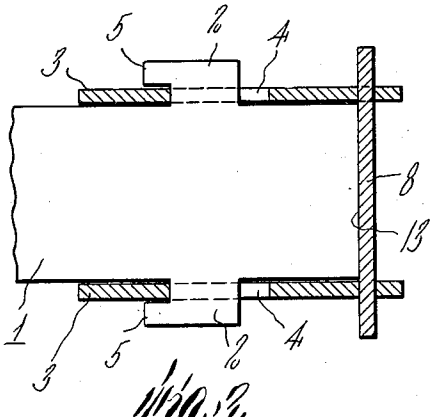


Fig. 3.

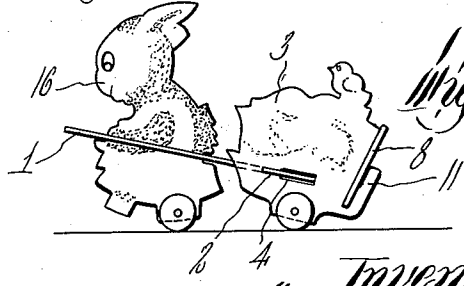


Fig. 4.

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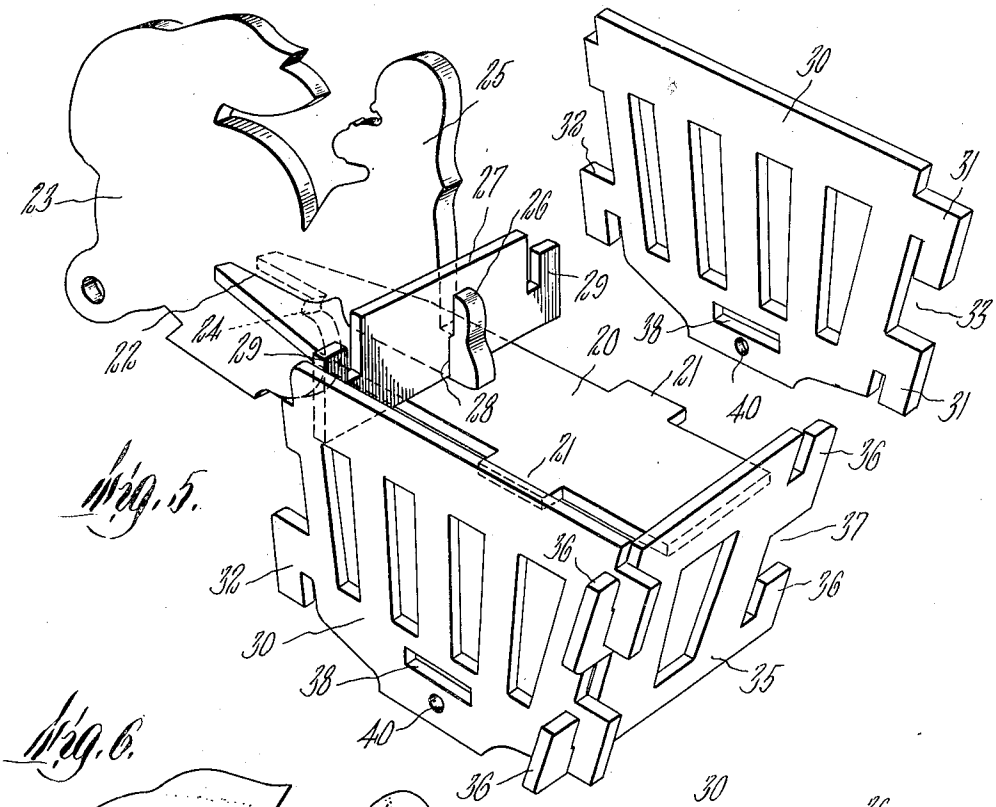


Fig. 5.

Fig. 6.

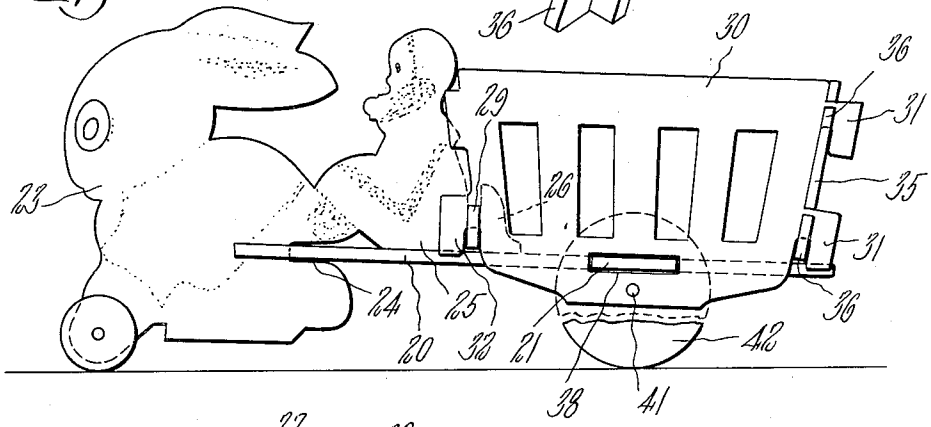
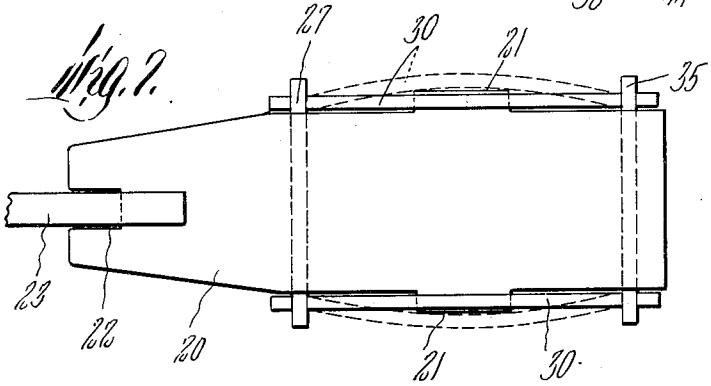


Fig. 7.



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SHEET MATERIAL ARTICLE AND METHOD OF MAKING THE SAME

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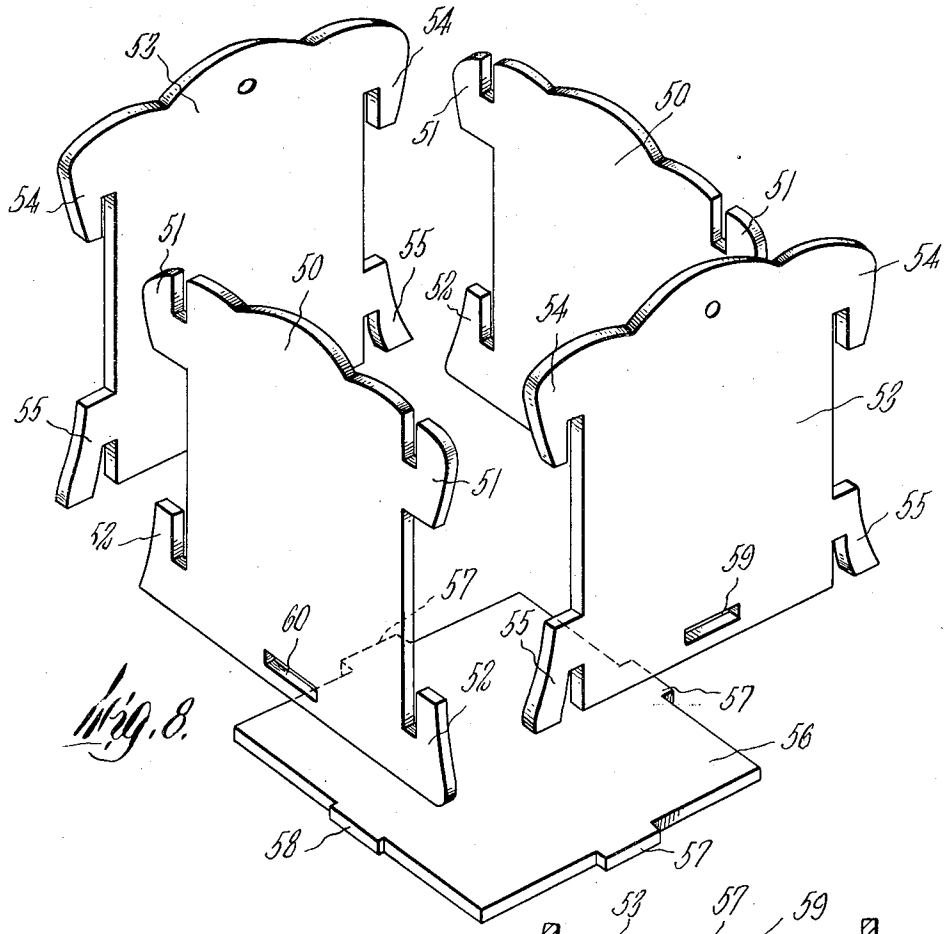


Fig. 8.

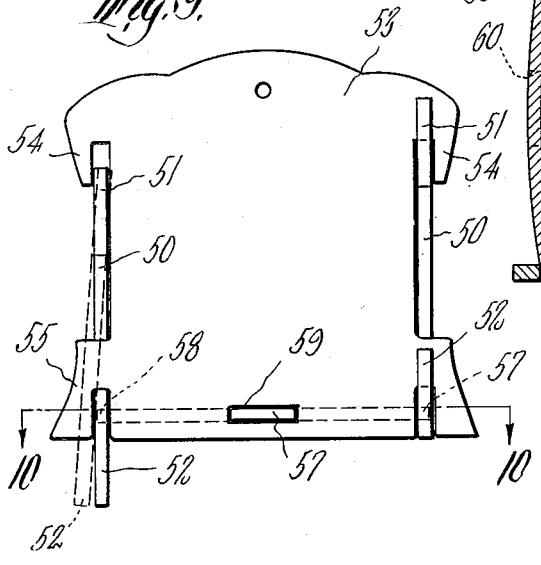


Fig. 9.

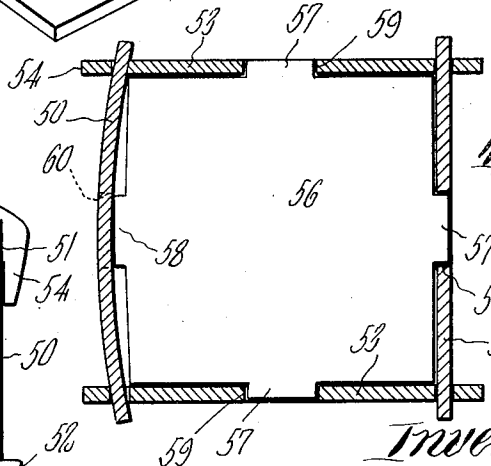


Fig. 10.

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UNITED STATES PATENT OFFICE

1,923,881

SHEET MATERIAL ARTICLE AND METHOD OF MAKING THE SAME

Harry Palais, Roxbury, Mass.

Application November 11, 1930
Serial No. 494,884

2 Claims. (Cl. 229—23)

This invention relates to sheet material articles and more particularly to such articles as are made of sheet material possessed of considerable stiffness, as multi-ply cardboard, the articles being in the form of receptacles or the like, and it has for an object to produce a structure which does not require any fasteners aside from portions of the sheet material pieces which form the several wall members of the articles. To this end the pieces are provided with interlocking portions, those of certain pieces being held in position by others thereafter assembled and with a final piece which prevents disengagement of those previously assembled and which is formed to cooperate with other parts to resist its own removal. These interlocking portions may comprise tongues some of which may be in the form of hooks engaging with other hooks or in slots of the neighboring pieces.

For a more complete understanding of this invention reference may be had to the accompanying drawings in which

Figure 1 shows in perspective cooperating parts for one structure embodying the invention.

Figures 2 and 3 are plan views partly in section showing successive steps in assembly of the parts shown in Figure 1.

Figure 4 is a side elevation to a smaller scale of the completed article.

Figure 5 is a perspective showing the parts for another article partly assembled.

Figure 6 is a side elevation of the finished article made from the parts shown in Figure 5.

Figure 7 is an inverted plan of the same showing the manner of assembling the final piece.

Figure 8 is a perspective of the parts for making a still different article.

Figure 9 is a side elevation of the same article showing the assembly of the final piece.

Figure 10 is a section on line 10—10 of Figure 9.

Referring to the construction shown in Figures 1 to 4, at 1 is indicated a base member having forwardly extending hooks 2 projecting from its opposite edges. Cooperating with these hooks are opposite side members 3 which as shown are provided with slots 4 through which the hooks 2 may be passed, as shown in Figure 2, after which the base member 1 may be moved forwardly relative to the side members 3 so that the forward ends 5 of the hooks 2 extend over the outer faces of the side members 3 about the forward end edges of the slots and prevent detachment of the side members from the base member. At 8 is shown a rear end wall member, which is shown as provided with a pair of slots 9 extending upwardly from its lower edge. The rear edges of the side members 3 are provided with slots 10 which form upwardly extending hooks 11. After the side members have been assembled with the base 1, as shown in Figure 3, the rear wall member 8 is then driven into position with the walls of the slots 9 engaging the inner and outer faces of the side members 3 beneath the slots 10 and the hooks 11 engaging the rear face of the back wall member 8 as shown in Figure 4. When in this position the portion 12 of the rear wall member between the slots 9 extends across the rear edge 13 of the base member 1 and acts as a barrier to prevent the base member from being pushed rearwardly so as to permit the wall members 3 to be freed from the hooks 2 to permit disassembly. The slots 9 of the rear wall member and the slots 10 of the side members are formed of such a width that it is necessary to drive or force the rear wall member into its assembled position, the rear wall member and the side members thus being held against disassembly by frictional engagement. As shown this receptacle thus formed represents the body of a two-wheeled toy cart, the forward portion of the base member 1 having a slot 15 therethrough with which may be engaged a toy figure 16 represented as pulling the cart. A material which is highly suitable for making this article comprises a laminated structure of sheets of cardboard glued together. Such a structure is sufficiently strong and stiff to lend itself to this method of interengagement by interlocking of the various parts, and while it is relatively stiff it can be deformed somewhat if necessary without danger of splitting or causing other damage thereto. Some bending or other deformation of the material may be required in the assembly of certains form of the invention, as will later be described.

Referring now to Figures 5 and 7, another article is shown in which the final piece to be assembled, which may be termed the "key" piece, is not held in assembled position by friction merely, but is formed to interengage with other previously assembled parts of the structure. Referring to these figures, at 20 is shown a base member provided with outwardly projecting tongue portions 21 at its side edges. Its forward end is shown as slotted as at 22 to receive a portion of a wheeled figure toy 23. This figure 23 is shown as provided with a notch 24 which may be interengaged with the notch 22 at the forward end of the base member 20, which represents a tongue portion of a cart, and the figure 23 is provided with a rear extension 25 representing a

driver for the forward animal figure portion, this extension resting on the upper face of the base member 20 and having at its rear end an upwardly extending hook 26. A forward end wall member 27 is centrally notched at 28 for engagement with the rear hooked end of the portion 25 and at its opposite ends has upwardly extended hook portions 29. At 30 are shown opposite side members each having at its rear edge downwardly turned hook portions 31 and at its forward end a singly downwardly turned hook portion 32. The hooked portions 31 are spaced by what may be termed an open slot 33, the upper portion of the slot forming the rear portion of the upper hook 31. It might be a closed slot, as shown at 4 in the construction shown in Figures 1 to 4, but greater facility for engaging and disengaging the parts is provided where the slots open out to the edges of the pieces as shown at 33 and in some cases this is necessary for assembly. A rear end wall member 35 is also provided which has a pair of upwardly extending hooks 36 at each of its side edges. The lower of these hooks 36 at each side is separated from the upper of the hooks by the open slot 37. The hooks 36 of the rear wall member 35 are interengaged with the hooks 31 at the rear ends of the side members 30 and the hook 32 at the forward end of each side member is interengaged with one of the hooks 28 of the front end wall member 27. The side wall members are then sprung apart sufficiently to permit the tongues 21 of the base member to be sprung into the slots 38 in the side members. In this assembled position of the parts the rear end of the base portion 20 extends beneath the end wall member 35, forming a barrier to prevent movement of this member downwardly relative to the side members which would be necessary to disengage the hooks 36 of the rear wall member from the side members. Likewise the base member 20 extends beneath the front end wall member 27 preventing this member from being moved downwardly relatively to the side members to disengage its hooks 28 from the hooks 22 of the side members, and this engagement of the hooks 28 with the hooks 22 likewise prevents upward movement of the front wall member 27 to disengage it from the hooked rear extremity of the figure portion 25. Likewise the engagement of the hook 26 with the front wall member 27 holds the figure element 23 against disassembly from the forward slotted tongue portion 21 of the base member 20. Thus the parts are all interengaged with each other in such a manner that disassembly is impossible without bending the side members sufficiently to first disengage the tongues 21 from these side members, and the material is of sufficient stiffness so that this is not liable to occur accidentally. As shown the side members 30 are provided with opposed perforations 40 beneath the slots 38 for the reception of an axle 41 provided with a pair of wheels 42.

Still another embodiment of this invention is shown in Figures 8 to 10. Referring to these figures, a pair of opposite side members 50 are shown as provided with upper and lower upwardly projecting hooks 51 and 52 extending from its side edges. The end members 53 are shown as provided with downwardly projecting upper and lower hooked members 54 and 55 extending from their side edges. These hooked portions on the side and end members are then interengaged in the completed article, as previously described, and a base member 56, formed to fit within the side and end members, is provided with tongues 57 and 58 which extend through slots 59 and 60 in the members 50 and 53. As shown the tongue 58 is somewhat shorter than the tongues 57 and it is preferably so made in order that the tongues 57 may extend well into or through the slots 59 for security of fastening and yet facilitate the assembly of the parts by forming the tongue 58 relatively short.

The assembly of the parts is illustrated in Figures 9 and 10. The wall members 53 are assembled with one of the side members 50 and the base member 56 is then placed in position with its tongues 57 engaging in the slots 59. The free edges of the members 53 opposite to the member 50 with which they are engaged are then brought toward each other to engage these members against the side edges of the base member 56. The other side member 50 is then inserted in position, first as shown dotted in Figure 9 with the upper hook members 51 engaging back of the hook members 54 of the members 53 and the lower edge of this member 50 beneath the hook members 55. By an upward and inward movement of the lower end of the member 50 this member may be brought up to its final position, the tongue 58 engaging on its inner face causing it to be bowed outwardly, as shown in Figure 10, until it is pushed upwardly sufficiently for the tongue 58 to spring into the slot 60, whereupon the resiliency of the material causes it to flatten and assume its final assembled position. This side member 50 may be termed the key piece for this construction. It prevents disassembly of the base from the end members 53 by preventing the latter from being moved away from the edges of the base member sufficiently to free the tongues 57, and the base member 56 with the tongue portions 57 and 58 acts as a barrier to prevent relative disengaging movements of the members 53 from the side members 50. Likewise, each of the wall members 50 and 53 acts as a barrier against movement of the base member 56 in directions to disengage it from the wall members 50 and 53 either adjacent or opposite thereto. This method of assembly is made possible by the use of the open slots forming the lower hook portions 55 of the side members which permits the lateral insertion of the finally positioned side member 50.

It will be seen, therefore, from the constructions shown, that various pieces which go to make up the article are secured together without the necessity of any separate fastening elements and by merely interlocking or interfitting engagement with other neighboring pieces. This is particularly desirable with structures in the nature of toys or the like which must be sold at a low price as it greatly facilitates and cheapens the assembly thereof. Since the various parts may be cut readily with dies and then assembled to the desired thickness, the formation of the interlocking elements adds an inconsequential amount to the cost of producing the various parts.

From the foregoing description of certain embodiments of this invention it should be evident to those skilled in the art that various changes and modifications might be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. A device of the class described comprising a plurality of pieces of sheet material each forming a wall of a receptacle, one of said pieces hav-

ing a hook extension, another of said pieces having a slot through which said hook extension may be passed and be interfitted with the end edge of said slot, and a third of said pieces carried by one of said hooked and slotted pieces and extending into the path of relative detaching movement of the other of said pieces to prevent detachment of said hooked and slotted pieces from each other, said third piece having portions interlocking with other pieces and preventing separation of said pieces without deformation of certain thereof.

2. A device of the class described comprising side, end and base wall members, said side and end members having oppositely extending interengaging hooks at their edges, said base member fitting between said side and end members and having tongues projecting into mating slots in said side and end members thereby preventing relative disengaging motions between said side and end members without deformation of certain of said members.

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