July 19, 1966 I. HOROWITZ ETAL 3,261,607

PLASTIC SWING OR LIKE SEAT

Filed March 23, 1964 3 Sheets-Sheet 1

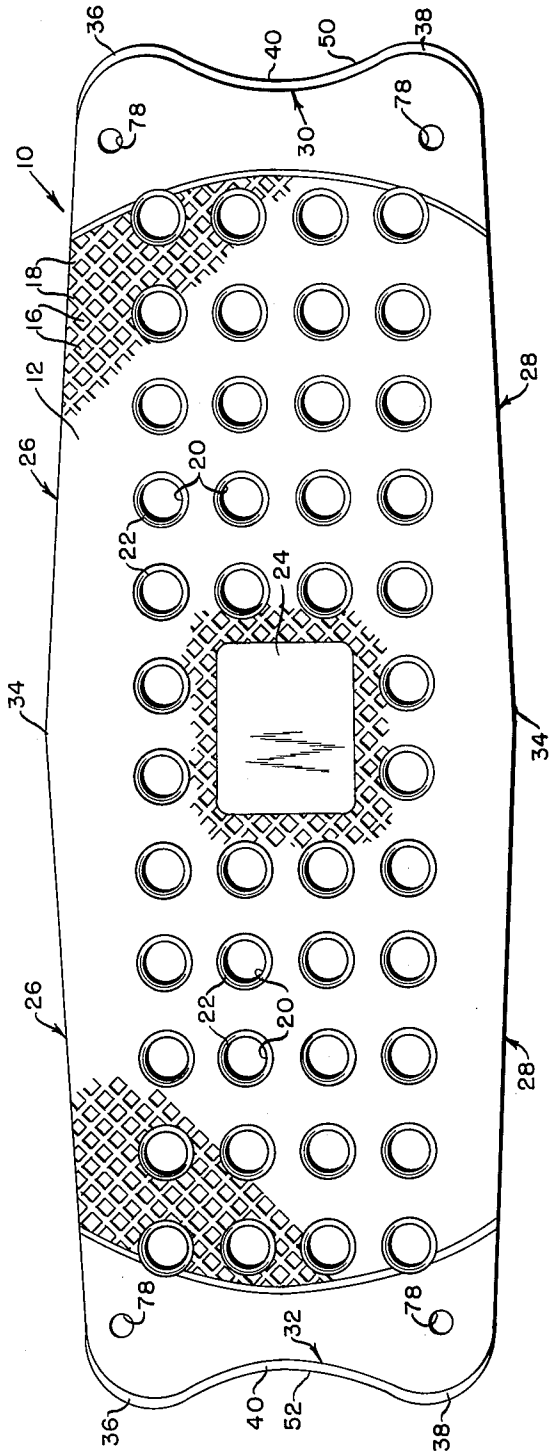



FIG. 1

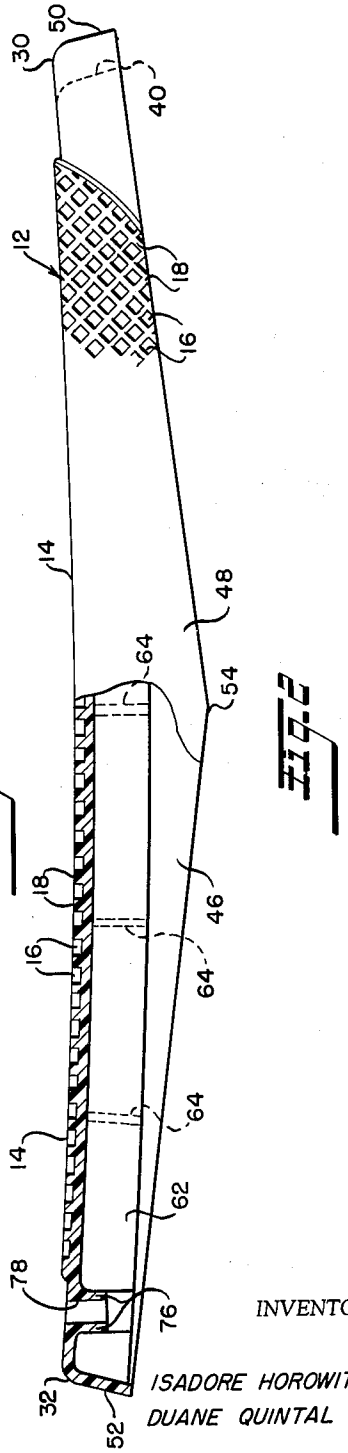



FIG. 2

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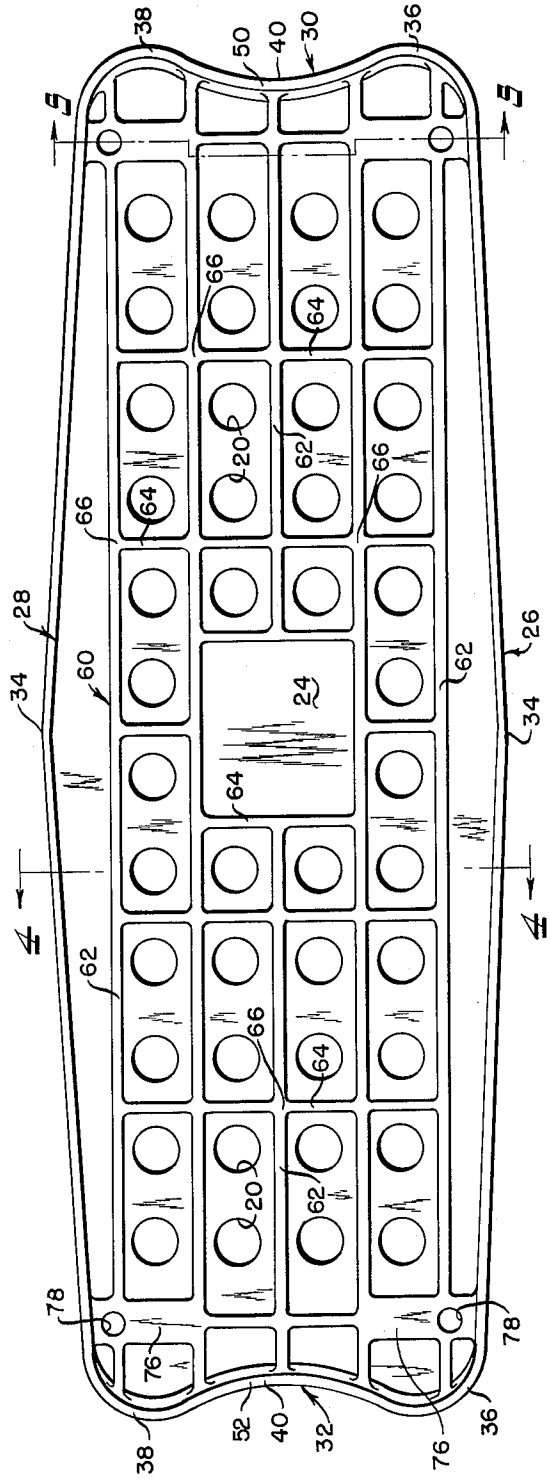



FIG. 3

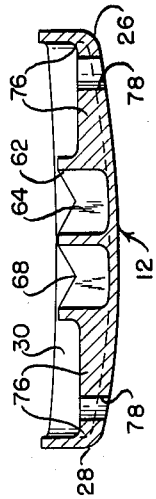



FIG. 4

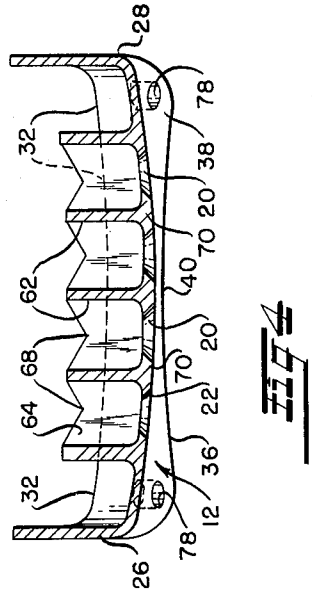



FIG. 5

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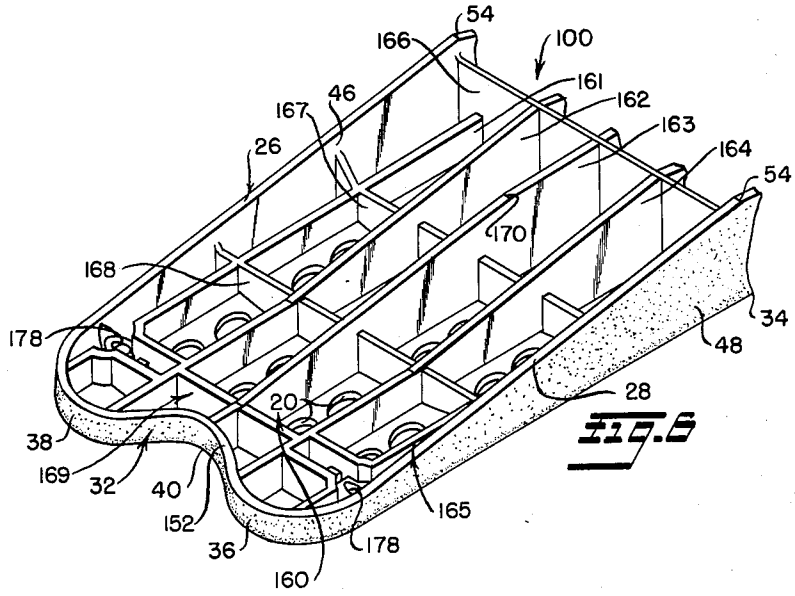



Fig. 6

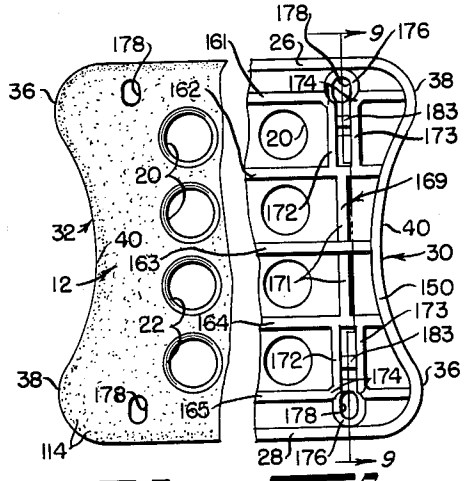



Fig. 7

Fig. 8

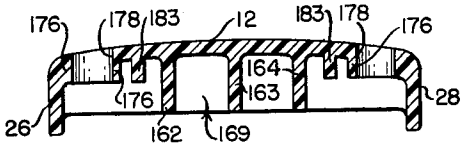



Fig. 9

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United States Patent Office 3,261,607 Patented July 19, 1966



3,261,607

# PLASTIC SWING OR LIKE SEAT

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5 Claims. (Cl. 272—85)

The present invention relates to play equipment and more specifically to the provision of light weight, long life plastic seat structure for play yard swing seats and like equipment.

In the past it has been the custom to provide play equipment seats made of wood or metal. Such prior art seats, while reasonably inexpensive, do not satisfactorily meet weathering conditions in outside usage with the result that they crack, splinter and rust and, when so weakened, become a source of frequent and severe injury to children who use them. Additionally, such prior art seats when built of sufficient strength to serve their intended purpose are quite heavy, often have sharp edges, particularly when broken or bent in use, and in use on swings, whirlarounds, seesaws and like play equipment where rapid movement of the seats take place become, due to their weight, dangerous sources of impact injury. Aside from these safety factors, the high weight of such prior art seats increases factory costs and ultimate sales prices due to in and out freight shipment costs and the need for painting, in addition to the incident increased factory cost, results in an element having a short appearance value due to chipping and fading of the paint.

It, accordingly, is a primary object of this invention to provide a seat structure for play equipment which is inexpensive to manufacture, has an exceedingly long operational and appearance life and eliminates or substantially reduces the dangers of user injury, minimizes the seriousness of injuries which may still exist, reduces market costs by minimizing shipping weight and eliminating the need for painting.

A further object of the present invention resides in the provision of a plastic seat structure for play equipment which is suitably constructed to be self-reinforcing to assure adequate resistance to bending and twisting in use and to resist the stresses imposed on the points of attachment to the swing chains, bars, or other structure of the play equipment to which they are applied.

Still another object of the present invention resides in the provision of a plastic seat structure for play equipment which is of relatively light weight or mass, is free of sharp edges and corners, weather resistant to assure a long useful life without splintering and breakage, and has a non-slip support surface minimizing the danger of the child users becoming unseated in use, particularly when standing as is frequently done.

Still further objects will appear from the following description and appended claims when read in conjunction with the accompanying drawings wherein:

FIGURE 1 shows one embodiment of the present invention in plan view illustrating generally the nature and contour of the upper face of the supporting member of the instant play equipment seat;

FIGURE 2 is a partly broken away side elevation of the embodiment of FIGURE 1 illustrating the downwardly extending, delimiting peripheral flange structure, rigidifying web reinforcement substructure, and the thickened boss attachment construction;

FIGURE 3 is a bottom plan view of the embodiment of FIGURE 1 further illustrating the peripheral flange structure, the rigidifying web reinforcement substructure and the thickened boss attachment construction;

FIGURE 4 is a cross section view taken along line 4—4 of FIGURE 3 illustrating the surface grip-enhancing apertures, the peripheral flange structure, and part of the rigidifying web reinforcement substructure;

FIGURE 5 is a cross sectional view taken along line 5—5 of FIGURE 3, further illustrating the thickened boss attachment construction;

FIGURE 6 is a partial bottom perspective view of a preferred embodiment of the present invention illustrating, in modified combination, peripheral flange structure, rigidifying web reinforcement substructure and thickened elongated boss attachment construction;

FIGURE 7 is a partial plan view of the embodiment of FIGURE 6 especially illustrating the roughened texture of upper face of the seat supporting member;

FIGURE 8 is a partial bottom plan view particularly illustrating the elongated thickened boss attachment construction and associated reinforcement substructure of the embodiment of FIGURE 6; and

FIGURE 9 is a cross sectional view taken along line 9—9 of FIGURE 8 further illustrating the elongated thickened boss attachment construction and associated reinforcement substructure of FIGURE 6.

One embodiment of the present invention is illustrated generally in FIGURE 1. Self-reinforcing seat **10**, adaptable to be combined with a swing set or the like having ground engaging supporting members and suspension members such as rods, cables or chains, is of so-called "rigid plastics," usually semi-rigid elastomeric material including polymerized resins which may be either of linear molecular structure or three-dimensional molecular structure. Linear molecular structure resins, such as molded polyethylene, are preferred for reasons of economy of manufacture.

Seat **10** is designed in such a way as to feature a supporting member **12** adapted to carry a child when utilized as a component part in play equipment. Supporting member **12** is contoured to be slightly downwardly arcuately shaped or concave in the longitudinal direction (FIGURE 2) and slightly upwardly arcuately shaped or convex in the lateral direction (FIGURES 4 and 5). This shape assures against sidewise sliding of the user relative to the seat and a close mating contoured fit between the seat upperside face and the user's buttocks to militate against unseating slippage forwardly or rearwardly of the seat, particularly when the user is being pushed. Waffle pattern structure **14** is molded into the upper face of supporting member **12** and consists of a network of depressed planar areas **16** and raised interconnected rib pattern **18**, which enhances the gripping characteristics of supporting member **12**, thus minimizing many serious falls and injuries to children consequential of slippage, particularly of standee users. As a further safety feature, spaced apertures **20** are provided thereby adding to the nonslip characteristics of supporting member **12**. Each aperture **20** varies in diameter so as to form taper **22** therein as shown in FIGURE 4. At the center of supporting member **12** is located segment **24** having neither waffle pattern **14** nor apertures **20**. This space is provided for identification markings by the manufacturer.

Another feature of the instant invention is the shape of self-reinforcing seat **10**. As shown in FIGURE 1, sides **26** and **28**, are delimited by strength providing downwardly extending flanges **46** and **48** which are divergent-convergent to each other in a direction longitudinal of seat **10** so that the distance separating flanges **46** and **48** is greatest at mid-point **34**. Ends **30** and **32** are delimited by strength providing flanges **50** and **52** and are sinuously shaped so as to be separated by a lesser distance intermediate sides **26** and **28** than adjacent sides **26** and **28**, forming double-reverse curve composed of outward curves **36** and **38** and inward curves **40** (FIGURE 1). The par-

ticular shape of flanges 46–52 contributes to the structural integrity of seat 10. As there seen, for convenience of manufacture, waffle pattern 14 may extend down flanges 46 and 48. Flanges 50 and 52, in this instance, join supporting member 12 at an angle inclined toward the vertical and are substantially uniform in vertical dimension. Flanges 46 and 48 are substantially perpendicular to supporting member 12 and are uniformly tapered in lateral dimension between flanges 50 and 52 to a maximum at mid-point 54 (FIGURE 2).

Supporting member 12 of seat 10 is rigidified or stabilized against torsional and bending loads and rendered self-reinforcing against torsional and bending loads by substructure reinforcement 60, best illustrated in FIGURE 3. Substructure reinforcement 60 is composed of longitudinal webs 62 and lateral webs 64 located intermediate apertures 20. Webs 62 and 64 are integrally joined, preferably by molding, to each other at fillet junctures 66. This mode of plastic reinforcement has been found to be structurally sound and economically feasible. Both webs 62 and 64 are substantially planar, web 62, in this instance, being substantially uniform in height dimension, and web 64 (FIGURE 4) varying in height dimension from a minimum intermediate junctures 66, at mid-point 68, to a maximum adjacent webs 62. Both webs 62 and 64 join supporting member 12 substantially at right angles at their filletted junctures 70 (FIGURE 4), and are preferably integrally molded therewith. Other similar forms of substructure web-like reinforcement might be utilized in place of substructure 60.

Another feature of the instant invention is the provision of thickened boss portions 76 for attaching seat 10 to play equipment so as to prevent failure in shear under normal concentrated loads caused by the attaching members of the play equipment which pass through apertures 78 to support seat 10. Thickened bosses 76 are preferably molded to the underside of supporting member 12 and between portions of the webs of substructure reinforcement 60 to further rigidify seat 10. FIGURE 5 illustrates the nature of thickened bosses 76 along the lateral dimension thereof between flanges 46 and 48, while FIGURE 2, at the left-hand portion, illustrates the nature of thickened bosses 76 longitudinally between flanges 50 and 52. While these bosses are corner located in the illustrated embodiment, it is to be understood that they may be otherwise located, for example along a transverse center line of the seat, if the seat were to be used as a seat for the conventional and widely used "Sky-Skooter" glider swing found in most present-day play type swing sets or seesaws.

A preferred embodiment of the present invention is illustrated in FIGURES 6 through 9 wherein seat 100 is similar to the above-described seat 10 where designated by like numerals and different therefrom where designated by different numerals. Only the differences between seat 100 and seat 10 will hereinafter be described.

The upper face of seat 100 is of slightly roughened granular-like texture 114 which serves to stabilize the user by preventing slippage even when surface moisture is present. In this embodiment flanges 150 and 152 (FIGURES 8 and 6) of ends 30 and 32 are substantially vertical forming approximately right angles with supporting member 12 and being of substantially uniform lateral dimension.

The substructure reinforcement 160 of seat 100, as seen in FIGURE 6, comprises longitudinal webs 161, 162, 163, 164 and 165 and lateral webs 166, 167, 168 and 169 all being preferably integrally molded with seat 100 so as to provide fillet junctures between associated parts. Both the longitudinal and lateral webs are substantially planar and join supporting member 12 at approximately right angles. All the longitudinal webs are preferably equidistantly spaced from each other with webs 161 and 165 being more closely spaced toward sides 26 and 28, respectively. All lateral webs are preferably equidistantly spaced from each other with web 169 being more



closely spaced to end 32. Only one-half of substructure 160 is illustrated in FIGURE 6 as seat 100 is symmetrical about the horizontal center line of web 166.

With continued reference to FIGURE 6, webs 161 and 165 are of approximately uniform height dimension between end 32 and web 168 and progressively increased in height dimension between webs 168 and 166, a greater increase existing between webs 167 and 166. Webs 162 and 164 are of uniform height dimension between end 32 and web 169, and progressively increase in height dimension between webs 169 and 166, a greater increase existing between webs 168 and 166. Web 163 is of a uniform height dimension between end 32 and web 169, and between point 170 and web 166, and uniformly increased in height dimension between web 169 and point 170.

Webs 166, 167 and 168 increase in height dimension immediately adjacent sides 26 and 28 to form fillet junctures therewith and also vary in height dimension as required to remain in contiguous relation with the convex under side of supporting member 12 between sides 26 and 28.

Web 169, illustrated in detail in FIGURE 8, consists of a single member 171 between webs 162 and 164 and spaced double members 172 and 173 between webs 162 and 161, and 164 and 165, respectively. Members 172 and 173 join webs 161 and 165, respectively, at concave transition sections 174, designed to accommodate a nut-fastened support bracket, as hereinafter explained.

Another feature is the provision of thickened boss portions 176 for attaching seat 100 to play equipment by means of support brackets so as to prevent failure in shear under normal concentrated loads caused by the attaching members of the play equipment which pass through cross sectionally elongated apertures 178 to support seat 100. Thickened bosses 176 are preferably molded to the underside of supporting member 12 between the sides 26 and 28 and transition sections 174 of substructure reinforcement 160. FIGURES 8 and 9 illustrate the nature of thickened bosses 176 in plan view and along the major dimension thereof, respectively. While these bosses are corner located in the preferred embodiment, it is to be understood that they may be otherwise located, for example along a transverse center line of the seat, if the seat were to be used as a seat for the conventional and widely used "Sky-Skooter" glider swing found in most present-day play type swing seats or seesaws.

Thickened bosses 176 and elongated apertures 178, in conjunction with spaced double members 172 and 173, transition sections 174 and stop 183 make seat 100 adaptable for use with either conventional nut-fastened threaded support brackets or one-piece support brackets as delineated in copending application of Bobbie L. White et al., Serial No. 340,895, filed on January 29, 1964, to which reference may be made for greater detail.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. A seat member adapted for use with swing sets and like playground equipment having attaching means for interconnecting said member and said equipment, said member comprising a homogeneous rigid plastic molded material formed to provide an elongated support member having an upperside surface and an underside surface, said member having a continuous integral depending flange forming dependent front, rear and side stiffening members adjoining its peripheral front, rear and side boundaries, said front and rear stiffening members ex-

tending in the direction of the longer dimension of the seat and varying in depth from a maximum depth in the region of their mid-length to smaller depths at points spaced from their mid-length, a grid of spaced but interconnected strengthening webs integrally molded with said support member and extending substantially normal to its underside surface within the boundaries of said depending flange, at least some of said strengthening webs intersecting said depending flange, at least some of said webs adjacent the transverse center line of said seat member having greater depths than others between said transverse center line and said side stiffening members of said integral depending flange, and said seat member being provided with a set of apertures therethrough for the insertion of seat attaching means.

2. The seat member described in claim 1 wherein said gride of spaced interconnected strengthening webs comprise a first group of spaced webs substantially paralleling the longitudinal center line of the seat member and a second group of spaced webs substantially paralleling the transverse center line of the seat member, the webs of said first group having a greater depth adjacent said transverse center line of the seat member than at points between said transverse center line and said side stiffening members of said integral depending flange.

3. The seat member described in claim 1 wherein said grid of spaced interconnected strengthening webs comprise a first group of spaced webs substantially paralleling the longitudinal center line of the seat member and a second



group of spaced webs substantially paralleling the transverse center line of the seat member, the webs of said second group adjacent said transverse center line having a greater depth than others of said group between said transverse center line and said side stiffening members of said integral depending flange.

4. The seat member described in claim 1 wherein some of said strengthening webs include portions adjacent said apertures so as to provide means for engaging and confining the attaching means.

5. The seat member described in claim 4 wherein said member has thickened boss portions adjoining each of said apertures and said portions of said strengthening webs adjacent said apertures, to strengthen said member in the region of said apertures and to provide seats for engagement by seat attaching means.

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