

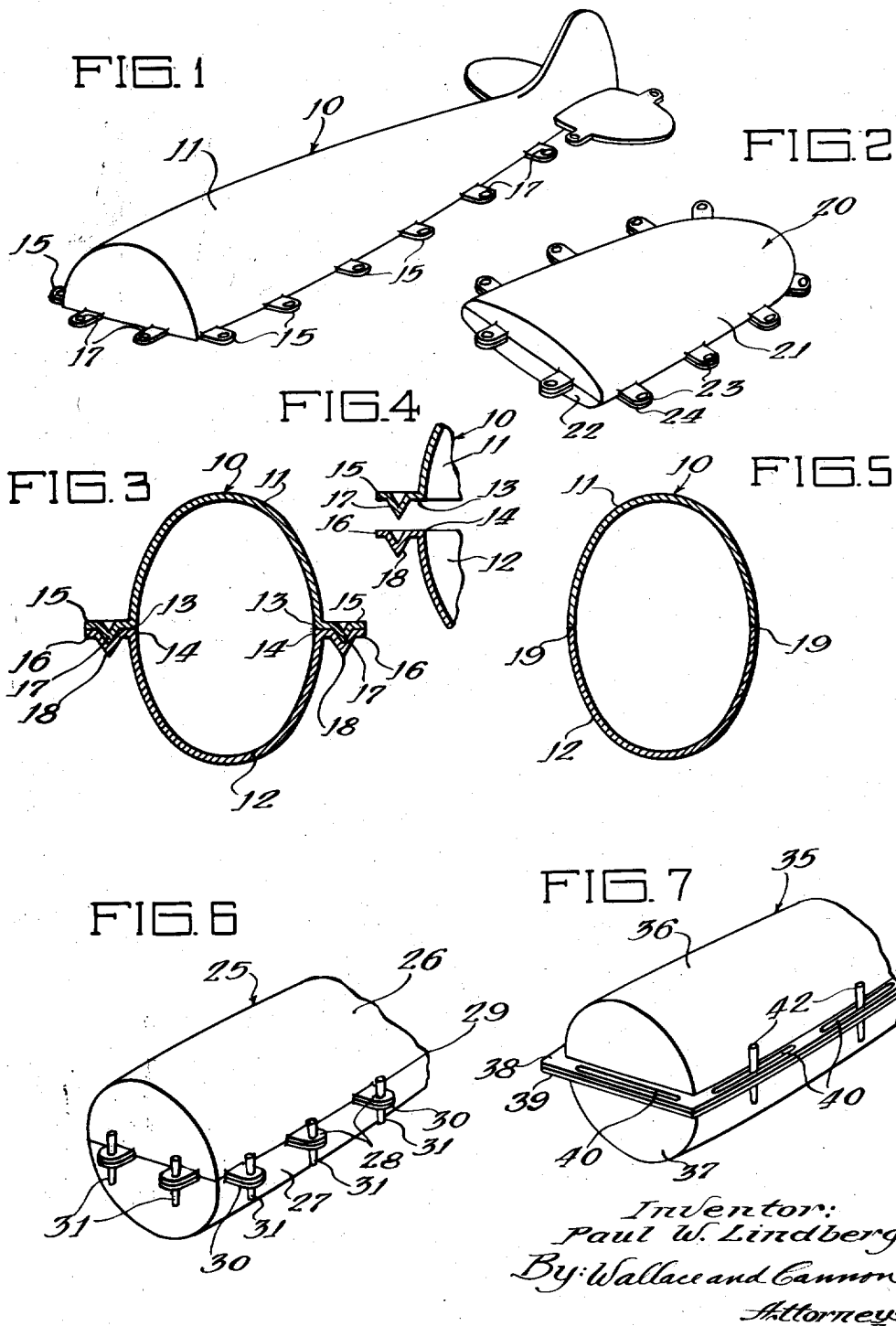
Jan. 12, 1960

P. W. LINDBERG
PLASTIC RESINOUS TOY PARTS AND METHOD
OF MAKING AND ASSEMBLING THE SAME

2,920,682

Filed June 22, 1956

3 Sheets-Sheet 1



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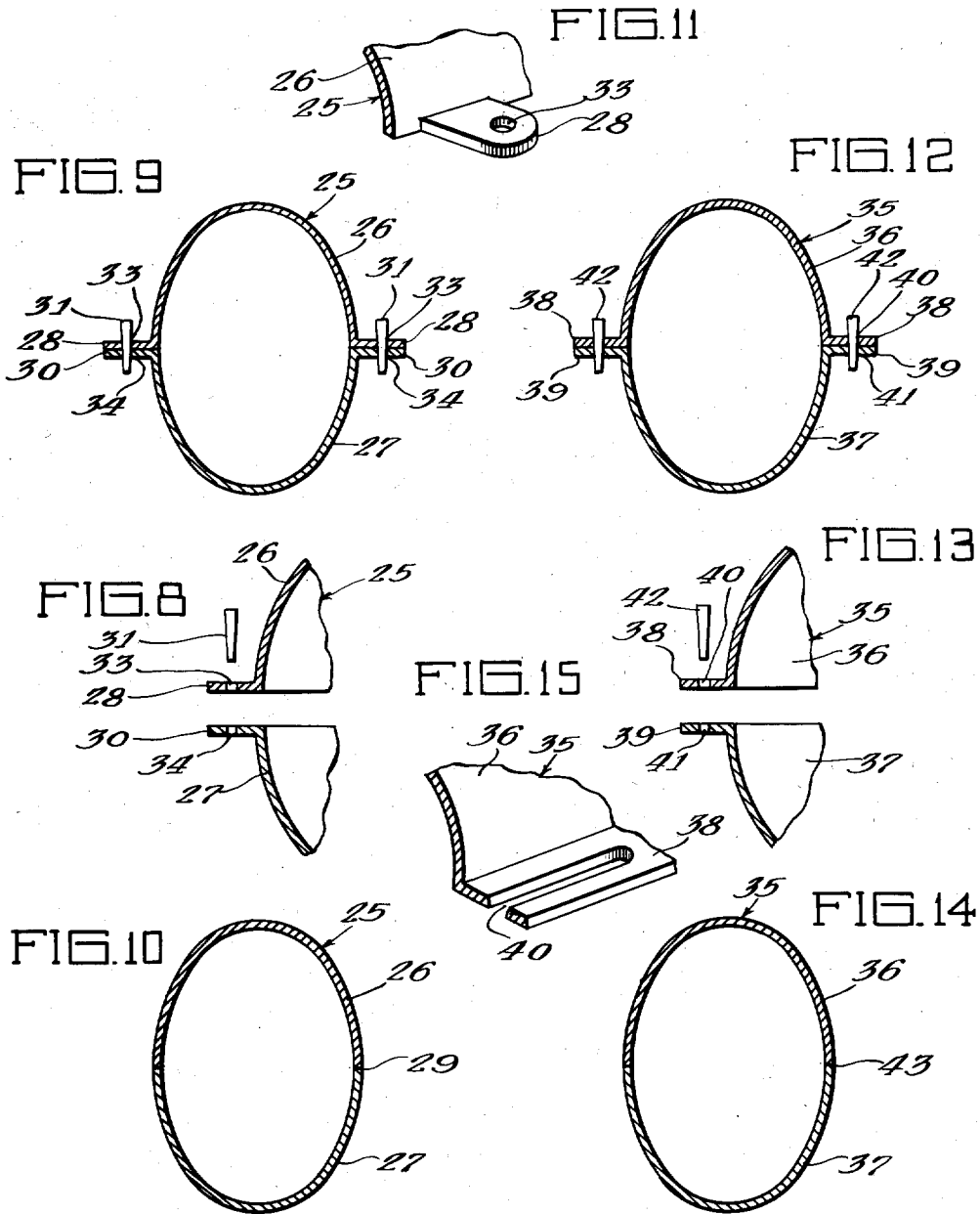
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FIG. 16

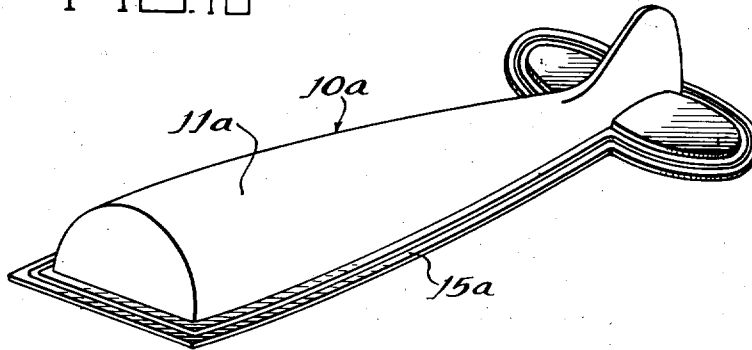


FIG. 18

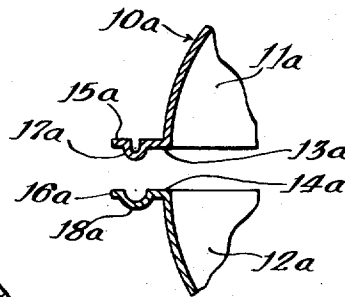


FIG. 17

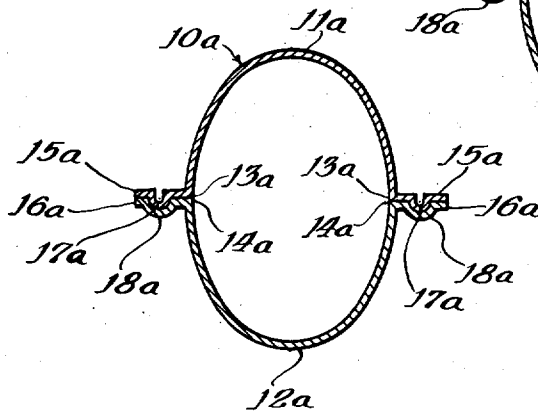
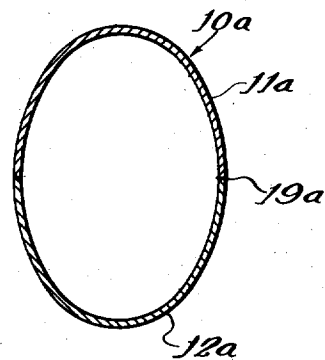


FIG. 19



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PLASTIC RESINOUS TOY PARTS AND METHOD OF MAKING AND ASSEMBLING THE SAME

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12 Claims. (Cl. 154-16)

This invention relates to plastic resinous toy parts and to a method of making and assembling the same.

In the manufacture of toys such, for example, as toy airplanes, toy boats, and the like, it is customary practice to make the structural parts of such toys of transparent plastic resinous materials such, for example, as polystyrene resin, and the like, and for the purchaser to adhesively secure the parts together, which is usually done by boys. However, one of the problems encountered in the use of such prior toys is the fact that it is difficult for a boy properly to center the complementary structural parts of the toy so that when the parts are adhesively secured together they present an unsatisfactory assembly job and an unsatisfactory appearance.

An object of the present invention is to provide new and improved plastic resinous toy parts for structural toys, such as toy airplanes, toy boats and the like, and a novel method of making and assembling such plastic resinous toys which, in use, overcomes the difficulties experienced in the prior art methods of assembling plastic resinous toys.

A further object of the present invention is to provide new and improved plastic resinous toy parts for structural toys, such as toy airplanes, toy boats, and the like, and a novel method of making and assembling the same and in the practice of which method the complementary parts of the plastic resinous toys are adhesively secured or bonded together in such a manner as to provide a smooth, uninterrupted outer surface and a resulting neat, trim, workmanlike appearance.

An additional object of the invention is to provide a new and improved method of centering and locating the complementary structural parts of plastic resinous toys, such as toy airplanes, toy boats, and the like, so that when the parts are adhesively secured or bonded together they will be bonded in proper structural relationship relative to each other.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawing which, by way of illustration, shows a preferred embodiment of the present invention and the principles thereof, and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention.

In the drawings:

Fig. 1 is a perspective view of the parts of the body or fuselage of a toy airplane as such parts appear at one stage in the practice of the new method of assembling plastic resinous toy parts;

Fig. 2 is a perspective view of the wing structure of a plastic resinous toy airplane as the same appears at one stage in the practice of the new method of assembling such toy parts;

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Fig. 3 is a transverse vertical sectional view of the toy airplane fuselage shown in Fig. 1;

Fig. 4 is a fragmentary sectional detail view illustrating parts of the walls of the fuselage shown in Figs. 1 and 3 and associated centering or locating members or tabs;

Fig. 5 is a transverse vertical sectional view of the fuselage shown in Figs. 1 and 3 after the centering or locating members or tabs have been cut therefrom;

Fig. 6 is a perspective view of a modification of the invention as applied to the fuselage of a toy airplane;

Fig. 7 is a perspective view of another modification of the invention as applied to the fuselage of a toy airplane;

Fig. 8 is a fragmentary exploded sectional view showing the parts of the fuselage illustrated in Fig. 6 as they appear before they are assembled;

Fig. 9 is a transverse vertical sectional view of the modification illustrated in Fig. 6 showing the parts as they appear after they are assembled and before the centering or locating members or tabs are cut therefrom;

Fig. 10 is a transverse vertical sectional view of the fuselage shown in Figs. 6, 8 and 9 as it appears after the centering or locating members or tabs are cut therefrom;

Fig. 11 is a fragmentary perspective view of a part of the fuselage and one of the centering or locating members or tabs embodied in the form of the invention illustrated in Figs. 6, 8, 9 and 10;

Fig. 12 is a transverse central vertical sectional view of the toy airplane fuselage shown in Fig. 7 as it appears after the parts are assembled and before the centering or locating members or tabs or elements are cut therefrom;

Fig. 13 is an exploded fragmentary sectional view illustrating the parts shown in Figs. 7 and 12 as they appear before they are assembled together;

Fig. 14 is a central vertical sectional view of the toy airplane fuselage shown in Figs. 7, 12 and 13 as it appears after the parts thereof have been assembled and the centering or locating members or tabs or elements have been cut therefrom;

Fig. 15 is a fragmentary perspective view illustrating a part of the fuselage and one of the centering or locating members or tabs embodied in the form of the invention shown in Figs. 7, 12, 13 and 14;

Fig. 16 is a perspective view illustrating a slightly modified form of the new plastic resinous toy parts and of the method of assembling the same as applied to assembling the parts of the body or fuselage of a toy airplane;

Fig. 17 is a transverse sectional view of the toy airplane fuselage shown in Fig. 16 as the parts appear after they have been arranged in complementary relationship and adhesively secured together;

Fig. 18 is a fragmentary sectional view illustrating the parts shown in Figs. 16 and 17 as they appear before they are adhesively bonded together; and

Fig. 19 is a transverse central sectional view illustrating the parts shown in Figs. 16, 17 and 18 as they appear after they have been arranged in complementary relationship and adhesively bonded together and the top and bottom centering or locating members cut therefrom.

A typical structural toy made in accordance with the practice of the present invention is illustrated, in part, in Fig. 1, and is shown as having the form of a toy airplane, the fuselage or body of which is generally indicated at 10, and includes an upper body member 11 and a lower body member 12, each of which is formed of and molded from a suitable plastic resinous material such, for example, as a polystyrene resin, or the like.

The upper body member 11 has a peripheral marginal edge 13 extending therearound at the bottom thereof and the lower body member 12 has a corresponding, mating and complementary peripheral marginal edge 14 extending therearound at the top thereof.

In the prior art of assembling plastic resinous structural toys it has been customary for the boy or other assembler to provide an adhesive bond between the mating marginal edges 13 and 14, as by means of a suitable adhesive, or to employ a solvent for the plastic resin applied at the mating edges 13 and 14 to soften the resinous material of which the parts 11 and 12 are made, at these points, and then place the parts in complementary mating relation and allow the applied adhesive or the solvent-softened resin to dry. However, one of the problems experienced in the prior art practice has been that it has been difficult in the practice of such methods properly to center or locate the complementary structural body parts 11 and 12 since the parts tend to shift when pressed together and to form an unsightly bead of adhesive material on the outer surface of the toy where the mating edges 13 and 14 come together.

In the practice of the present invention I overcome the aforesaid difficulty experienced in the prior art methods of assembling plastic resinous structural toys by providing a series of spaced upper locating or centering members or tabs 15 by molding as integral extensions of the side wall of the upper body part 11 and a similar series of complementary suitably spaced lower centering or locating members or tabs 16 which are molded as integral extensions of the side wall of the lower body member 12. Each of the upper centering or locating members or tabs 15 has a centrally arranged downwardly extending male locating element 17 formed as a boss thereon and each of the lower centering or locating members or tabs 16 has a complementarily centrally arranged downwardly extending female centering element 18 formed as a recess or depression therein.

In the practice of the present invention the centering or locating members or tabs 15 and 16 are formed as integral extensions of the body parts 11 and 12, respectively, and when the boy or other assembler is ready to assemble the complementary structural toy parts 11 and 12, he may either coat the mating marginal edges 13 and 14 of the parts 11 and 12 with a suitable adhesive cement, or the like, or he may apply a solvent for the plastic polystyrene or other resinous material to the mating marginal edges 13 and 14 and then bring the toy parts 11 and 12 into complementary and mating relationship with each of the male locating elements 17 engaged in a corresponding one of the female locating elements 18. The thus assembled structural toy parts are then allowed to stand for a sufficient length of time to enable the adhesive cement applied at the mating marginal edges 13 and 14 to dry, or to allow the solvent-softened resinous material to dry along the mating peripheral edge surfaces 13 and 14 thereof, and thus bond the upper and lower body parts 11 and 12 of the toy together as at 19, in properly assembled relationship.

After the complementary structural toy parts 11 and 12 have thus been integrally bonded together, the boy or other assembler may then take a scissors, or other suitable cutting instrument, and clip off the centering or locating members or tabs 15 and 16 flush with the side edges of the side walls of the body parts 11 and 12 with the result that the complementary structural body parts 11 and 12 are thus joined together in properly located position relative to each other and the thus assembled toy part presents an uninterrupted smooth outer surface and a neat, trim and attractive appearance, as shown in Fig. 5.

Fig. 2 illustrates the present invention as applied to the complementary parts of another structural toy part, namely, a toy airplane wing, which is generally indicated at 20, and which may be formed of polystyrene or other plastic resinous material, and includes an upper wing part 21 and a lower wing part 22 having upper locating tabs 23 and lower locating tabs 24, respectively, formed thereon and which correspond, respectively, to the locat-

ing or centering members or tabs 15 and 16 in the form of the invention illustrated in Figs. 1, 3 and 5.

The method of assembling the parts 21 and 22 of the wing structure 20, shown in Fig. 2, is the same as the method of assembling the parts of the fuselage structure shown in Figs. 1, 3, 4 and 5, and the locating members or tabs 23 and 24 are cut from the parts 21 and 22 of the wing structure 20 after the assembling operation, in the same manner as explained heretofore in connection with the practice of the invention as applied to the assembly of the parts of the fuselage shown in Figs. 1, 3, 4 and 5.

A modification of the invention is illustrated in Figs. 6, 8, 9 and 10 of the drawings which show the invention as applied to the assembly of the parts of an airplane fuselage 25, which includes an upper fuselage or body member 26 and a lower fuselage or body member 27.

In the form of the invention illustrated in Figs. 6, 8, 9 and 10 the upper fuselage member 26 has a series of spaced centering or locating members or tabs 28 formed integrally thereon along its lower peripheral marginal edge 29 and the lower fuselage member 27 has a series of spaced centering or locating members or tabs 30 formed thereon along its upper peripheral marginal edge. In this form of the invention, the male and female centering elements 17 and 18, which are embodied in the members 15 and 16, respectively, in the form of the invention illustrated in Figs. 1, 3, 4 and 5, are eliminated and in lieu thereof fastening members in the form of tapered pegs 31 are employed and these fastening members or pegs 31 are driven downwardly through suitable complementary registered openings 33 and 34 which are provided in the centering or locating members or tabs 28 and 30, respectively.

After the toy parts 26 and 27 have been adhesively bonded together, along their mating marginal edges, as at 29, in the same manner as hereinbefore described in reference to the form of the invention illustrated in Figs. 1, 3, 4 and 5 of the drawings, the centering or locating members or tabs 28 and 30 and attached locating elements or pegs 31 are cut from the body of the fuselage, flush with the outer surface thereof, whereupon the thus assembled toy parts will present an uninterrupted smooth outer surface and a neat, attractive appearance, as shown in Fig. 10.

Another modification of the invention is illustrated in Figs. 7, 12, 13, 14 and 15 of the drawings, and is shown as applied to an airplane fuselage 35 which includes an upper body member 36 and a lower body member 37. In this form of the invention, the upper fuselage or body member 36 has a peripheral marginal flange 38 formed integrally therewith along its lower peripheral marginal edge and the lower fuselage or body member 37 has a complementary peripheral marginal flange 39 formed integrally therewith along its upper peripheral marginal edge. The upper peripheral marginal flange 38 has a series of elongated spaced slots 40 formed therein and the lower peripheral marginal flange 39 has a similar series of correspondingly spaced and elongated slots 41 formed therein.

In the method of assembling structural plastic resinous toy parts according to the modification of the invention illustrated in Figs. 7, 12, 13, 14 and 15, tapered pegs 42, similar to the tapered pegs 31, are employed and after the toy parts 36 and 37 are brought together in assembled relationship, with their mating peripheral marginal edges adhesively bonded together, as at 43, in the manner hereinbefore described in connection with other forms of the invention, the elongated slots 40 and 41 will be disposed in registry with each other, in pairs. One of the locating pegs 42 is then inserted through each pair of the registered slots 40 and 41, whereupon the peripheral marginal flange portions 38 and 39 and attached pegs 42 are cut or trimmed from the body of the fuselage or toy part 35 to provide a smooth uninter-

rupted-

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ed outer surface on the toy and a resulting neat, trim, and attractive appearance, as illustrated in Fig. 14.

A modification of the new plastic resinous toy parts and the new method of assembling the same are illustrated in Figs. 16 to 19, inclusive, of the drawings. This form of the invention is similar to the form of the invention illustrated in Figs. 1, 3, 4 and 5 of the drawings and those parts which are similar or comparable to parts shown in Figs. 1, 3, 4 and 5 have been given similar reference numerals followed by the additional and distinguishing reference character "a."

In the form of the invention illustrated in Figs. 16 to 19, inclusive, of the drawings, the upper and male centering or locating member is formed as a continuous outwardly extending lateral flange 15a which is molded integrally with and extends entirely around the upper body member 11a and has a male centering or locating rib 17a formed centrally therein on its lower surface, and the lower or female centering or locating member is formed as a continuous outwardly extending flange 16a which is molded as an integral part of the lower body member 12a and has a centrally arranged groove 18a formed therein and extending therearound on its lower surface.

In the practice of that form of the new method illustrated in Figs. 16 to 19, inclusive, of the drawings, the upper and lower centering or locating flange members 15a and 16a are arranged in complementary relationship with the male locating element 17a engaged in the female centering or locating element 18a and adhesively secured therein as, by solvent-softening of the polystyrene resin of which the parts may be made, or by applying a suitable adhesive along the lower marginal surface 13a of the upper body part 11a and along the upper marginal surface 14a of the lower body part 12a. Accordingly, when the adhesive bond has dried the flanges 15a and 16a and parts 17a and 18a, respectively, may be cut from the body members 11a and 12a, respectively, flush with the outer surfaces thereof, whereupon the parts 11a and 12a will be adhesively bonded together, as at 19a, to provide a smooth outer surface and neat appearance in the assembled toy parts.

It will thus be seen from the foregoing description, considered in conjunction with the accompanying drawings, that the present invention provides a new article of manufacture in the form of new and improved plastic resinous toy parts and a new and improved method of making and assembling the parts of plastic resinous toys, and that the invention thus has the desirable advantages and characteristics, and accomplishes its intended objects, including those hereinbefore pointed out and others which are inherent in the invention.

I claim:

1. As a new article of manufacture, complementary plastic resinous toy parts including mating peripheral edge surfaces and adapted to be adhesively bonded together in an assembled relationship along said mating peripheral edge surfaces, each of said complementary toy parts including an outer surface having complementary locating members formed integrally therewith on its outer surface along and projecting laterally from the said mating peripheral edge surfaces, said locating members having a relatively small thickness adjacent said peripheral edges to permit severance therefrom flush with the said outer surfaces of said toy parts after the latter have been adhesively bonded together along the said mating peripheral marginal edge surfaces, the locating members on one of said toy parts including means registering with a complementary means on the locating members of the other of the toy parts with the locating members in abutting relationship for positively preventing relative lateral movement between said toy parts and with said peripheral edge surfaces in abutting relationship thereby insuring a good adhesive bond between said peripheral edge surfaces.

2. As a new article of manufacture, plastic resinous

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toy parts as defined in claim 1 in which each of the said complementary locating members embodies a tab projecting laterally from the outer surface of one of the said toy parts and a complementary tab projecting laterally from the other of said toy parts, and in which said tabs have complementary male and female centering elements formed therein which engage each other to retain the said parts together in predetermined alignment.

3. As a new article of manufacture, plastic resinous toy parts as defined in claim 1 in which each of the said complementary locating members embodies a tab projecting laterally from the outer surface of one of the said toy parts and a complementary tab projecting laterally from the other of said toy parts, and in which said tabs having complementary male and female centering elements formed therein which engage each other to retain the said toy parts together in predetermined alignment, and in which said tabs are arranged in pairs spaced at intervals along the outer surface of the said toy parts, and in which the male element is formed in the upper tab of each of said pairs of tabs and the female centering element is formed in the bottom tab of each pair of said centering elements.

4. As a new article of manufacture, structural plastic resinous toy parts as defined in claim 1 in which said locating members are arranged in pairs spaced at intervals along said mating peripheral marginal edges and in which each of said locating members has a centrally arranged opening formed therein, with said openings being disposed in registry with each other and in which a fastening member extends through the registered openings in each pair of said centering or locating members, extending centrally therethrough.

5. A new article of manufacture as defined in claim 1 in which said locating members are in the form of flange members molded integrally with each of said toy parts on the outer surface thereof and adjacent its peripheral marginal edge and projecting laterally outwardly from the outer surface thereof, and in which each of said flange members has an elongated slot formed therein with the said slots being disposed in registry with each other, and in which a fastening member extends through said registered slots.

6. A new article of manufacture as defined in claim 1 in which said locating members are in the form of flange members molded integrally with each of said toy parts on its outer surface and adjacent its peripheral marginal edge and projecting laterally outwardly from the outer surface thereof, and in which each of said flange members has a plurality of elongated spaced slots formed therein with the said slots being disposed in pairs in registry with each other, and in which a fastening member extends through each pair of said registered slots.

7. A new article of manufacture as defined in claim 1 in which said locating members are in the form of flange members molded integrally with each of said toy parts on its outer surface and adjacent its peripheral marginal edge and projecting laterally outwardly from the outer surface thereof, and in which each of said flange members has a plurality of elongated spaced slots formed therein with the said slots being disposed in pairs in registry with each other and in which a fastening member in the form of a tapered peg extends through each pair of said registered slots.

8. As a new article of manufacture, plastic resinous toy parts as defined in claim 1 in which each of the said complementary locating members is in the form of a flange projecting laterally from the outer surface of one of the said toy parts and extending therearound, and a complementary flange projecting laterally from the other of said toy parts and extending therearound, and in which said flanges have complementary male and female centering elements formed therein which engage each other to retain the said parts together in predetermined alignment relative to each other.

9. As a new article of manufacture, plastic resinous toy parts as defined in claim 1 in which each of the said complementary locating members is in the form of a flange projecting laterally from the outer surface of one of the said toy parts and extending therearound at its lower marginal edge, and a complementary flange projecting laterally from the other of said toy parts and extending therearound its upper marginal edge, and in which said flanges have complementary male and female centering elements formed therein which engage each other to retain the said toy parts together in predetermined alignment and in which the male centering element is formed in the upper one of said flanges and the female centering element is formed in the lower one of said flanges.

10. In a method of making and assembling the parts of plastic resinous structural toys of the type which include complementary structural toy parts made of molded plastic resinous materials which are adapted to be adhesively bonded together along mating peripheral marginal edges, the improvement which resides in molding locating members integrally with said structural toy parts on the outer surfaces thereof and along said mating peripheral marginal edges and projecting laterally from the outer surfaces of said parts, providing an adhesive bond along said mating peripheral marginal edges of said toy parts inwardly of the associated locating members, arranging the said toy parts together in assembled relationship and allowing the said adhesive bond to dry, and then cutting the said locating members from the said structural toy parts flush with the outer surfaces of the said toy parts, whereby the locating members are entirely removed from the toy parts and the two toy parts are secured to one

another solely along the mating peripheral marginal edges thereof

11. The method as defined in claim 10 in which said locating members have openings formed therein, and including the steps of disposing said openings in the locating members of one toy part in alignment with the openings in the locating members of the other toy part, and extending a fastening member through each pair of aligned openings for securing the toy parts in assembled relationship.

12. The method defined in claim 10 in which said locating members are in the form of laterally projecting flanges, said flanges including complementary male and female centering elements formed integrally therewith, and including the additional step of inserting the male centering elements within the female centering elements for securing the top parts in assembled relationship.

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