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H. HELFER

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CONSTRUCTIONAL TOY COMPOSED OF SEPARABLE RODS AND PLATES

Filed May 15, 1964

FIG. 1.

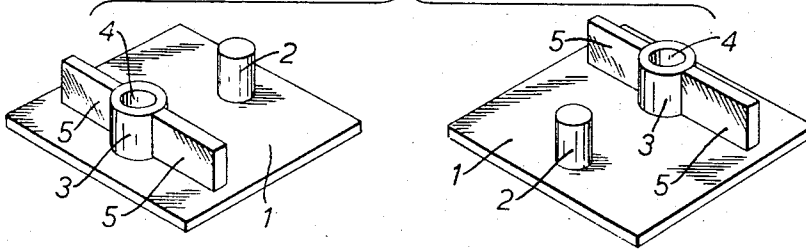
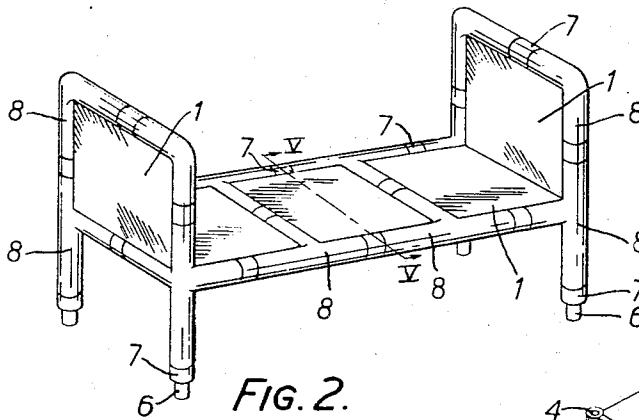


FIG. 2.

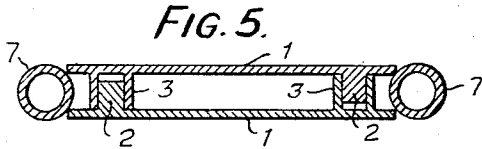


FIG. 5.

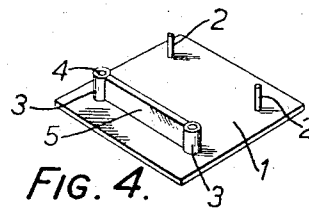


FIG. 4.

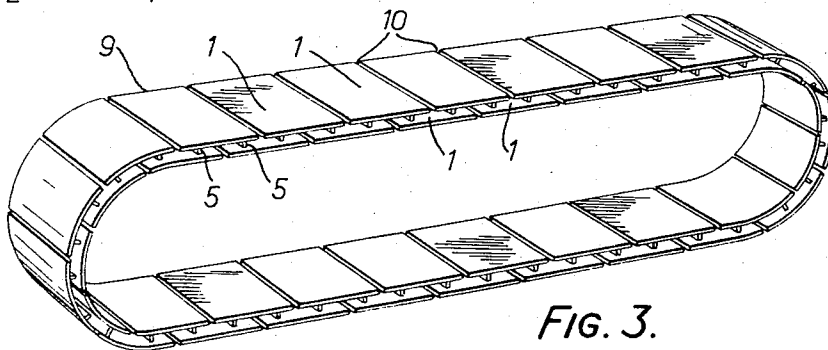


FIG. 3.

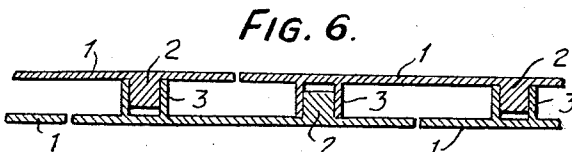


FIG. 6.

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CONSTRUCTIONAL TOY COMPOSED OF SEPARABLE RODS AND PLATES

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3 Claims. (Cl. 46—17)

The invention relates to interlocking toys which include a plurality of rod-like members which can be releasably assembled together to form open frames, and panel elements for covering the apertures in those frames.

In order that the plates will be capable of assembly element takes the form of a cover plate provided on its inner surface, in the vicinity of at least two opposing edges, with outwardly inclined retainer elements in the form of flange-like strips or studs, which elements come to bear resiliently against the frame members when the cover plate is fitted to a frame, and act in clamping fashion to hold the plates fast in front of the zonal apertures and against the assembled components. This method of fitting the cover plates has the disadvantage that the plates cover the frames on one side only, and the apertures and retainer elements accordingly have a disagreeable appearance on the other side in the case of a flat structure which is visible from both sides.

According to a feature of the invention (whose precise scope is defined in the appended claims), a more pleasing appearance may be imparted to such by the use of plates which are capable of being releasably secured together in spaced parallel pairs by means of co-operating male and female coupling elements provided on the inner surfaces of the plates.

The plates may be so designed that they can alternatively be used as constructional elements independently of the components which make up the open frames; they may be adapted for assembly into a strip or endless belt, for example for the tracks of a toy tracked vehicle or a conveyor belt for a toy belt-type conveyor.

Some embodiments of the invention are described below by way of example with reference to the accompanying drawings, wherein:

FIGURE 1 is a perspective illustration of two identically shaped individual plates for assembly together as a panel element;

FIGURE 2 shows a toy bed made up of interlocking components and interlocking plates;

FIGURE 3 shows an endless belt made up of interlocking plates;

FIGURE 4 shows a perspective elevation of an individual plate with two male and two female coupling elements,

FIGURE 5 is a sectional view taken along the line V—V of FIGURE 2; and

FIGURE 6 is a sectional view taken through an assembly made from the components shown in FIGURE 4 with the section being taken in a plane including the axes of pins 2 and sleeves 3.

The plates described herein are preferably made of soft resiliently flexible synthetic plastic material, and are rectangular in shape, preferably square, although plates of other shapes, for example circular, are within the scope of the invention.

Each panel element comprises two identical individual plates 1, 1, each provided on its inner surface with a male coupling element constituted by a cylindrical stud 2 near one edge, and a female coupling element constituted by a cylindrical tubular projection 3 near the opposite edge. The relative diameter of the bore in the projection 3 and the stud 2 on the associated opposing plate 1 are such that

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the stud can make firm frictional engagement in the bore 4. The projection 3 is adjoined by two webs 5, 5 extending parallel to the neighbouring transverse edge of the plate and terminating short of the longitudinal edges of the plate, the said webs being of the same height as the projection 3. The stud 2 and the projection 3 with the two webs 5, 5 may conveniently be formed integrally with the plate by injection moulding.

The individual plates 1 are fitted together in spaced parallel relationship by registering the stud 2 on one plate 1 with the bore 4 in the tubular projection 3 on the other plate, and the stud 2 on the latter with the hollow cylindrical projection 3 on the first-named plate 1, and pressing the plates together, to effect firm frictional interengagement of the studs and the projections. The webs 5, 5 serve as additional spacing pieces for the two individual plates, and for locating the plates in the aperture to be covered. They also impart good stiffening to the plates in the assembled state.

In FIGURE 2 there is illustrated a three dimensional structure, in the form of a toy bed, which is made up by connecting together constructional elements in the form of rod-like members 7, provided at their ends with connecting spigots 6, and connecting pieces 8 of various forms, e.g. angular T-shaped, double-T-shaped, or cruciform, the connecting pieces 8 having tubular ends pointing in different directions for receiving spigots 6. A two-piece panel element as described above is simply fitted to each of the square, open frames of this structure by positioning one plate on each side of the frame, and pressing the plates together to effect interengagement of the studs 2 and tubular projections 3. When the panel element is properly assembled, each individual plate 1 is supported against the tubular projection 3 and against the webs 5, 5 on the opposing plate, and the edges of both plates are supported against the round rod-shaped and tubular interlocking components 7, 8. The height of the projections 3 and webs 5 is such that the external surfaces of the two individual plates are then flush or substantially flush with the outer edges of the frame components 7, 8. The two-piece elements, locked in the apertures in the frames, completely cover the apertures from both sides, and impart a solid and pleasing appearance to the structure.

As may be seen in FIGURE 1, the stud 2 and the tubular projection 3 on each individual plate 1 are arranged on the longitudinal centre line of the plate 1, and are at a distance from the adjacent transverse edges of the plate equal to or only slightly less than a quarter of the length of the plate. This arrangement enables a large number of individual plates to be made up into a continuous strip or, as shown in FIGURE 3, into an endless belt 9, wherein the individual plates 1 in one row are offset longitudinally with respect to the individual plates 1 in the other row. Narrow gaps 10 are left between individual plates 1 in each row if the distance of the studs 2 and projections 3 from the edges of the plate is somewhat less than a quarter of the length of the side of the plate; the gaps disappear if this distance is exactly equal to a quarter of the length of the side of the plate.

The fact that the individual plates 1 can be fitted together to make strip-shaped structures as a result of this arrangement of the coupling elements, leads to new possibilities of combination and construction which make the interlocking constructional toy still more attractive and interesting.

With panel elements of comparatively large area, it is expedient to provide a plurality of studs 2 and hollow cylinders 3, as shown for example in FIGURE 4.

In a known form of constructional toy, each panel together in the manner indicated in FIGURE 3, the studs and projections are preferably arranged symmetri-

cally with respect to the longitudinal centre lines of the plates.

I claim:

1. A constructional toy comprising a plurality of rod-like members, means for releasably connecting said members together to form an open frame defining an aperture, and a panel element for fitting to said frame to cover said aperture, said panel element comprising a pair of generally flat plates each plate having at least one dimension which is greater than the corresponding transverse dimension of said frame aperture, said plates being provided with means for detachably securing said plates to each other and to said frames, said securing means including co-operating studs and tubular projections which are positioned to interengage when said plates are positioned on opposite sides of said frame, with said studs in register with said tubular projections, and pressed together.

2. A constructional toy in accordance with claim 1, wherein said plates are identical with each other, each

being provided with at least one stud and at least one tubular projection.

3. A constructional toy as claimed in claim 1 comprising at least one web projecting from each plate in the same direction as the tubular projection thereon and integral with said projection.

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