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Staats

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[54] TRACK SYSTEM FOR TOY VEHICLE

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[73] Assignee: **Mattel, Inc.**, Hawthorne, Calif.

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[52] **U.S. Cl.** ..... **238/10 E**, 46/1 K

[51] **Int. Cl.** **A63h 19/30**

[58] **Field of Search** ..... 46/26, 29, 31, 1 K; 238/10 R, 238/10 E, 10 F

[56] **References Cited**

UNITED STATES PATENTS

3,487,999	1/1970	Nash et al.	238/10 E
3,228,607	1/1966	Robinette et al.	238/10 F
2,231,089	2/1941	Rorer	46/26
3,480,210	11/1969	Perrinjaquet	238/10 E
3,558,048	1/1971	Bach	238/10 E
2,862,333	12/1958	Gardiol	238/10 E

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Assistant Examiner—Richard A. Bertsch
Attorney—Seymour A. Scholnick

[57] **ABSTRACT**

A track system for toy vehicles having a three sectioned track connector for creating and maintaining alignment of adjacent track sections. To provide improved alignment, greater track section strength and stiffness, and to increase the frictional connection between track sections, each track section has four depending flanges which cooperate with the track connector, the inner two flanges for receiving the central section of the track connector and the outer two flanges each receiving one of the outer sections of the track connector. The track connector additionally has protuberances causing the track connector central section to assume an arcuate shape thereby engaging the track sections along a greater surface area.

7 Claims, 5 Drawing Figures

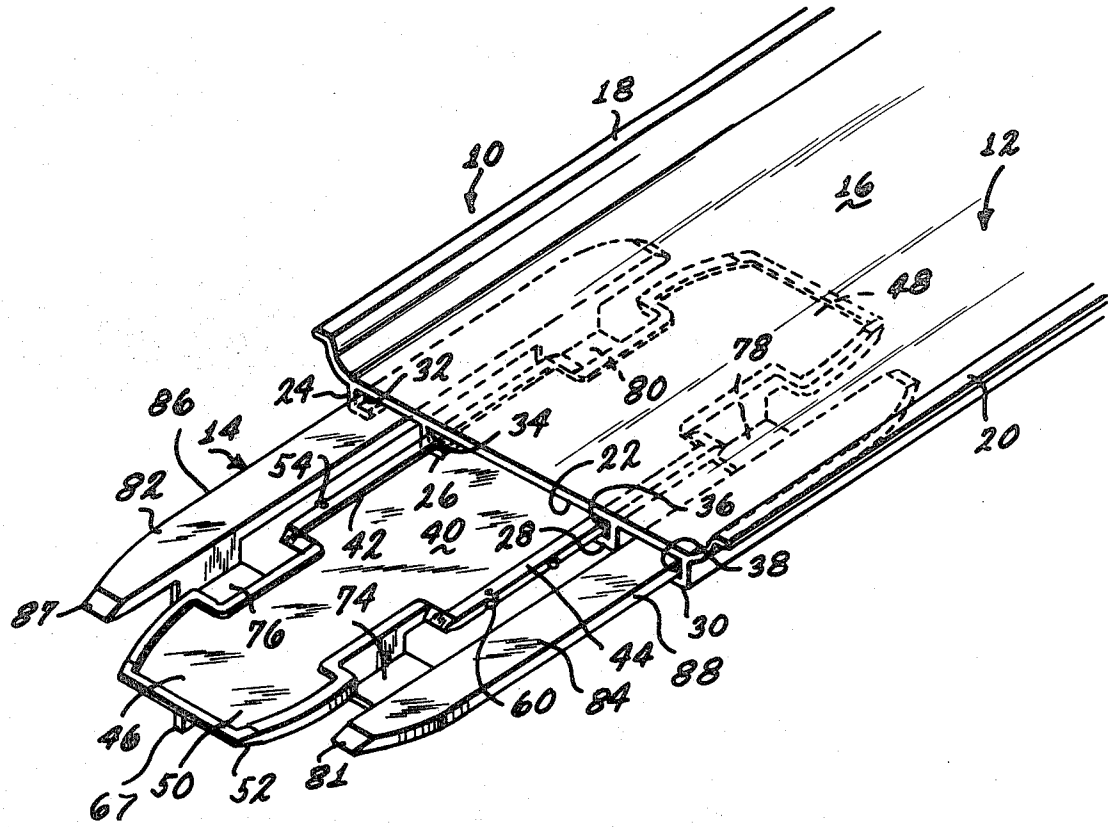


FIG. 1

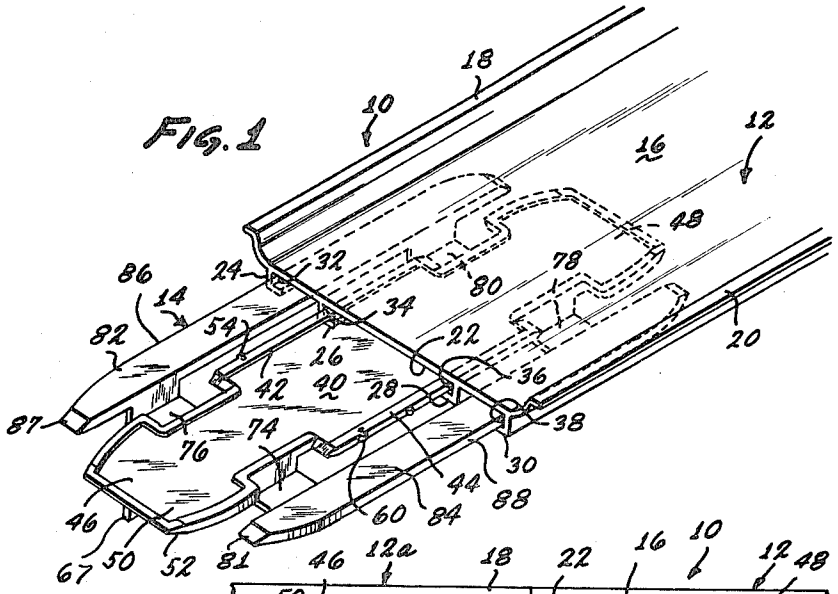


FIG. 2

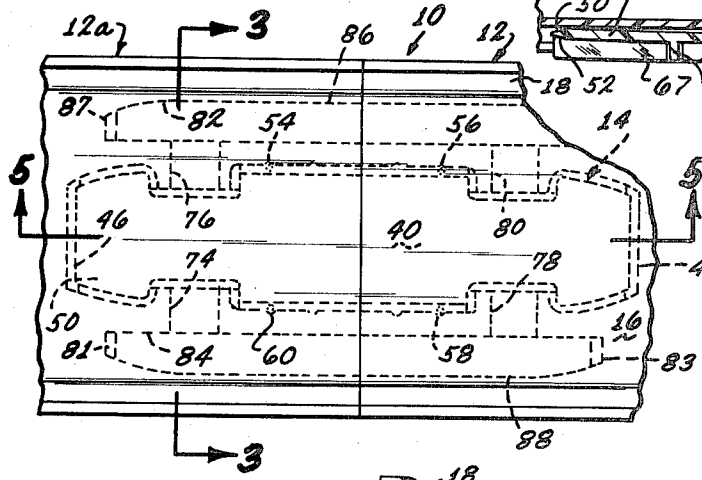


FIG. 5

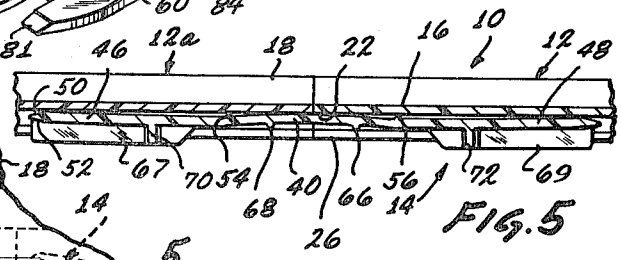


FIG. 3

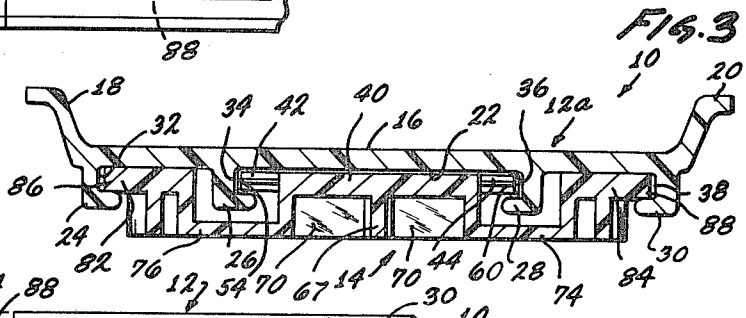
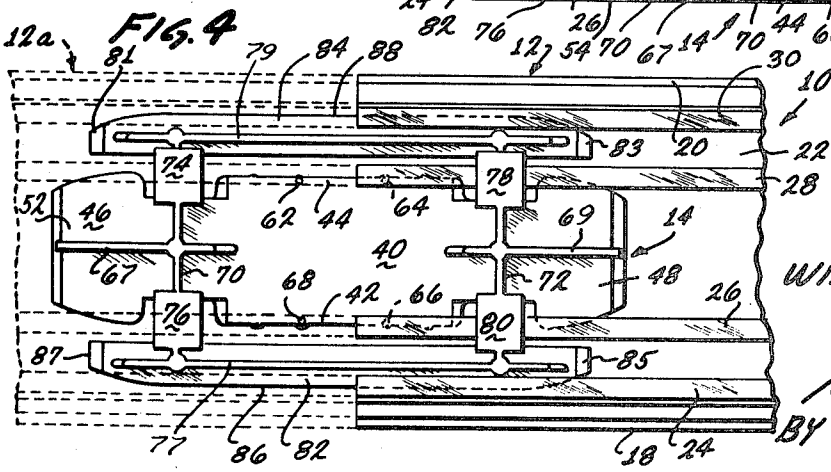


FIG. 4



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TRACK SYSTEM FOR TOY VEHICLE

BACKGROUND OF THE INVENTION

The background of the invention will be set forth in two parts.

1. Field of the Invention

The present invention relates generally to a roadway or track system, and more particularly to a track system for a toy vehicle which includes strengthened track sections and a track connector which aligns and stiffens adjacent track sections.

2. Description of the Prior Art

Track or roadway systems for toy vehicles are known in the prior art as exemplified by a patent to Nash et al., U.S. Pat. No. 3,487,999, issued Jan. 6, 1970, to the assignee of the present invention, and has been marketed extensively under the trademark "HOT WHEELS." The track system disclosed in the above-mentioned patent has functioned exceedingly well for toy vehicles of a relatively small scale; that is, vehicles having a width of about 1 to 1 ¼ inches while the track section width is about 1 ½ inches. However, when the scale of the toy vehicle is changed, especially for larger scale vehicles, a change becomes desirable for the track system in order to achieve optimum results. Larger track sections are more difficult to align when connecting one section to another, and larger track sections were more difficult to keep aligned during use presumably in part due to the larger and heavier vehicles. Often times two parallel tracks are used to race one toy vehicle against another; if a vehicle passing from one track section to another collides with a misaligned track section end, the car may be reflected transversely off the track or at least jarred sufficiently to slow the speed of the vehicle thereby affecting the race results.

Another concern for any track system is that it be economically manufactured. Since a track system of synthetic resin material provides sufficient durability to withstand abuse and flexibility to allow twisting and curving to enable various track system layouts, it is desirable to develop a track system where as many as possible of the components are fabricated by an extrusion process. Those components which cannot be extruded must, for economic reasons, be easily molded.

SUMMARY OF THE INVENTION

Accordingly, it is a general aim of the present invention to provide a new and improved track system for a toy vehicle comprising at least one elongated track section of substantially uniform cross section throughout its length, the track section including a first face portion for supporting the vehicle, oppositely disposed guide flanges extending essentially the length of the track section depending from the second face portion for strengthening and stiffening the track section and for defining a receptacle for a track connector whereby the track section may be connected to an additional track section; and a track connector adapted to be partially inserted between the flange elements and having three integral sections, a central section having opposed edges and being of a width several times the thickness thereof, and two outer sections each spaced laterally from and extending parallel to an edge for aligning adjacent track sections and for stiffening the abutting track section ends. As mentioned, the depending flange elements provide added strength and stiffening to the track section, while the three-sectioned connector provides additional surface contract with the track sections to provide improved alignment and stiffening.

An object of the present invention is to provide a track system having improved strength and stiffening characteristics.

Another object of the present invention is to provide a track system having a track connector which improves the alignment and stiffness of abutting track sections.

Still another object of the present invention is to provide a track system wherein the track sections are held in improved frictional engagement.

Yet another object of the present invention is to provide a track system which is strong, sufficiently stiff and yet economically fabricated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a track system featuring an end portion of a track section and a track connector.

FIG. 2 is a plan view illustrating two track sections in abutment with a track connector shown in dotted lines in its operative portion.

FIG. 3 is a sectional elevational view taken along line 3—3 of FIG. 2.

FIG. 4 is a plan view illustrating the engagement of a track connector and a track section.

FIG. 5 is a sectional elevational view taken along line 5—5 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIG. 1, there is illustrated a track system **10** which includes a portion of a track section **12** and a track connector **14**. As contemplated for its intended use, a number of track sections will be connected in a serial fashion with a number of track connectors, one track connector at each abutment of two track sections. The track system may be laid along a flat surface, such as a floor, or it may be attached at some location above a floor, such as a table top, with the remainder of the track sloping downward toward the floor and along the floor. It is also contemplated that various accessories may be included in any track system layout, including specially designed curves jump ramps, loops, lane mergers, and various devices for imparting motion to a toy vehicle. Generally, the toy vehicle will ride upon a first or upper face portion **16** of the track section and will be maintained and guided on the upper face portion by two guide flanges **18** and **20**, which are integrally connected to the upper face portion and which project obliquely from the face portion as more clearly shown in FIG. 3.

Referring now to FIGS. 1, 3 and 4, the track section **12** will be described in more detail. The cross section of the track section as shown in FIG. 3 extends throughout its length and, as will be described in more detail below, is of such a design as to be easily extruded. As already mentioned, the upper face portion **16** is the roadway on which the toy vehicle will move and the guide flanges **18**, **20** keep the vehicle confined to the track section. It is contemplated that the width of

the upper face **16** is greater than the width of the corresponding toy vehicle so that the toy vehicle may move in response to a lateral component of movement causing the vehicle to come into contact with one or the other of the two guide flanges. A preferred width for just the upper face is about 2 inches, while the overall width of the track section is about 2 ⅝ inches. By being located in an oblique fashion, a properly designed toy vehicle will have little area contact with the guide flanges so as not to cause an excessive frictional engagement.

Opposite the upper face **16** is a lower or section face portion **22** from which extends four flange elements **24, 26, 28, 30**. Since the flange elements extend parallel to the longitudinal axis of the track section, the flange elements strengthen and stiffen the track section. As shown, each of the flange elements has a generally L-shaped cross section and form with the lower face **22** two channels which define a receptacle for the connection of the track connector **14**. The four flange elements can be considered as forming an inner channel and an outer channel; the inner channel is defined by the flange elements **26, 28** and the lower face **22**, while the outer channel is defined between the flange elements **24, 30** and the lower face **22**. Four U-shaped enclosures are also formed such as the enclosure **32** formed by the flange element **24** and a portion of the lower face, enclosure **34** formed by the flange element **26** and a portion of the lower face, enclosure **36** formed by the flange element **28** and a portion of the lower face, and enclosure **38** formed by the flange element **30** and a portion of the lower face. As will be explained below the inner and outer channels engage with different sections of the track connector to form an improved connection between two track sections.

To achieve an improved alignment between abutting track sections, for stiffening the track section end portions and for providing an improved frictional engagement, the track connector **14** is divided into three integral sections as illustrated in FIGS. **1, 3** and **4**. The track connector includes a central section **40** having opposed edges **42, 44** extending the length of the central section and two end portions generally designated **46, 48** where the edges **42, 44** are curved slightly in a converging manner while the upper surface **50** and lower surface **52** are beveled. The reason for the converging and beveled end portions is to facilitate the partial insertion of the track connector into the channels of the track section.

The central section **40** also includes eight protuberances located in four sets of pairs, one pair located adjacent each of the edges on each of the upper and lower surfaces **50, 52**. Thus, the pair of protuberances **54, 56** are located on the upper surface **50** along the edge **42**, the pair of protuberances **58, 60** are located on the upper surface along the edge **44**, the pair of protuberances **62, 64** are located on the bottom surface **52** along the edge **44** and the pair of protuberances **66, 68** are located on the bottom surface along the edge **42**. In addition, each of the protuberances extend slightly along its corresponding edge to provide a slight ridge or projection in the edge. It is to be noted that the spacing between each of the protuberances in the pairs of protuberances on the upper surface is greater when measured parallel to the longitudinal axis of the track connector than the spacing between the protuberances of the two pairs connected to the bottom surface. Hence, when the track connector is in position, as more clearly shown in FIG. **5** connecting two abutting track sections, the central section is formed into an arcuate shape. The formation of the arcuate shape causes the upper surface of the central section of the track connector to frictionally engage the bottom face of the track sections over a large area, thereby creating an improved frictional connection.

As most clearly shown in FIG. **4**, each of the end portions **46, 48** of the central section is integrally connected with a depending flange such as the flange **67** attached to the end portion **46** and the flange **69** attached to the end portion **48**. The depending flanges extend in a direction parallel to the longitudinal axis of the track connector. Disposed at right angles to the flange **67** is another depending flange **70** integral with the surface **52**, while an identical flange **72** is disposed perpendicular to the flange **69** and depends integral from the bottom surface **52**. The flanges **67, 69, 70, 72** act to strengthen and stiffen the end portions of the track connector and, in addition, stiffen connector arms **74, 76, 78, 80**, which connect the central section **40** to two outer sections **82, 84**. The outer sections are disposed laterally from the central section and are a short distance from the edges **42, 44**. As with the central section, each of the outer sections **82, 84** has an outer edge, such as the outer edge **86** for the outer section **82** and the outer edge **88** for the outer section **84**. In addition, the two outer sections have end portions **81, 83, 85** and **87** which are tapered and beveled so as to facilitate the insertion of the track connector into the channels of the track section. And each outer section has a depending flange, such as flange **77** for section **82** and flange **79** for section **84**.

When the track connector is, as shown in FIG. **2**, half inserted into each of two abutting track sections, **12** and **12*a***, it becomes clear how the advantages of alignment and improved connecting force is achieved. As noted, the track connector central section **40** is engaged and entrapped by the inner channel bordered by the flange elements **26, 28** so that the edges **42, 44** are within the enclosures **34, 36** respectively. The protuberances connected to the upper and lower surfaces of the central section provide a good, frictional hold by bearing against the lower face of the track section and the lower portion of the L-shaped flange in the outer channel which is bordered by the flange elements **24, 30**, so that the outer edges **86, 88** are received respectively within the U-shaped enclosures **32, 38**.

It is readily apparent now that with the present track system there is substantially more surface contact between the track connector and a track section than was possible in the prior art. Further because the outer sections of the track connector are separated from the central section and positioned very close to the peripheries of the track section, the increased bearing surfaces between the track section, and the track connector and the relative positions of the three track connector sections achieve improved alignment especially of the guide flanges and the upper face immediately adjacent the guide flanges thereby providing a minimum of interference with a toy vehicle moving along the track system.

What is claimed is:

1. A track system for a toy vehicle comprising:

at least one elongated track section of substantially uniform cross section throughout its lane, said track section include a first face portion for supporting said vehicle, oppositely disposed guide flanges extending essentially the length of the track section projecting obliquely from said first face portion for guiding said vehicle and maintaining said vehicle on said track section, said guide flanges spaced apart to permit a lateral component of movement of said vehicle on said first face, a second face portion lying opposite said first portion, and at least four flange elements extending essentially the length of said track section depending from said second face portion for strengthening and stiffening said track section and defining a receptacle for a track connector whereby said track section may be connected to an additional track section; and

a track connector adapted to be partially inserted between said flange elements and have three integral sections, a central section having opposed edges and being of a width several times the thickness thereof, and two outer sections spaced laterally from and extending parallel to an edge for aligning adjacent track sections and for stiffening the abutting track section ends wherein said outer sections of said track connector include converging and beveled end portions for facilitating engagement with a track section and wherein said outer sections each include a depending flange extending substantially the length of said outer sections for strengthening and stiffening said outer sections.

2. The track system as claimed in claim 1 wherein said central section has opposed surfaces and including spaced protuberances extending from each of said surfaces for frictionally engaging said flange elements and said second face portions, said protuberances located in two pairs on each of said surfaces with each pair adjacent an edge and symmetrical about the longitudinal axis of said track connector and where the protuberances on one of the surfaces are spaced a greater longitudinal distance than the protuberances on the other of said surfaces whereby said protuberances cause said central section to assume an arcuate form when said track connector engages two adjacent track sections; and

said central section includes two end portions each having converging edges and beveled surfaces for facilitating engagement with a track section and wherein said central section end portions include depending flanges for strengthening and stiffening said end portions.

3. A track system for a toy vehicle comprising:

at least one elongated track section of substantially uniform cross section throughout its length, said track section including a first face portion for supporting said vehicle, oppositely disposed guide flanges extending essentially the length of said track section projecting obliquely from said first face portion for guiding said vehicle and maintaining said vehicle on said track section, said guide flanges spaced apart to prevent a lateral component of movement of said vehicle on said first face, a second face portion lying opposite said first face portion, and four parallel flange elements depending from said second face portion, each of said flange elements having substantially L-shaped cross sections and forming inner and outer channels for receiving a track connector, said flange elements for stiffening and strengthening said track section; and

a track connector adapted to be partially inserted between said flange elements and having three integral sections, a central section having opposed edges and being of a width several times the thickness thereof, said two outer sections each spaced laterally from and extending parallel to an edge for aligning adjacent track sections and for stiffening and abutting track section ends, said central section of said track connector being receivable by said inner channel of said track section and said outer sections being receivable by said outer channel.

4. A track system as claimed in claim 3 wherein said central section of said track connector has opposed surfaces and including spaced protuberances extending from each of said surfaces for frictionally engaging said flange elements and said second face portion, said protuberances located in two pairs on each of said surfaces with each pair adjacent an edge and symmetrical about the longitudinal axis of said track connector and where the protuberances on one of said surfaces are spaced a greater longitudinal distance than the protuberances on the other of said surfaces whereby said protuberances cause said central section to assume an arcuate form when said track connector engages two adjacent track sections.

5. A track system as claimed in claim 4 wherein said central section includes two end portions each having converging edges and beveled surfaces for facilitating engagement with a track section and wherein said central section end portions include depending flanges for strengthening and stiffening said end portions; and wherein said outer sections include converging and beveled end portions for facilitating engagement with a track section and wherein said outer sections each include a depending flange extending substantially the length of said outer sections for strengthening and stiffening said outer sections.

6. The track system as claimed in claim 5 wherein two of said flange elements are spaced apart a distance slightly greater than the width of the central section of said track connector and the remaining two flange elements are spaced from said first mentioned two flange elements and are spaced apart a distance slightly greater than the width of the track connector; the protuberances having the greater longitudinal spacing are engageable with the second face portion of said track section while the remaining protuberances are engageable with the first two mentioned two flange elements, and

said outer sections of said track connector engage said remaining two flange elements for aligning adjacent track sections and for stiffening the abutting track section ends.

7. A track system for a toy vehicle comprising:

at least one elongated track section of substantially uniform cross section throughout its length, said track section including an upper face portion for

supporting said vehicle, oppositely disposed guide flanges extending essentially the length of said track section projecting from said first face portion for guiding said vehicle and for maintaining said vehicle on said track section, a lower face portion lying opposite said upper face portion and four parallel flange elements each having a generally L-shaped cross section depending from said lower face portion and extending essentially the length of said track section for defining a receptacle for a track connector; and

a track connector adapted to be partially inserted into said flange elements and having three integral sections; a central section having opposed edges, upper and lower surfaces, a width several times the thickness thereof, and four spaced protuberances extending from each of said upper and lower surfaces, said protuberances located in two pairs on each of said surfaces with each pair disposed adjacent an edge, the protuberances on said upper surface being spaced longitudinal at a greater distance than the protuberances of said lower surface, and two outer sections each spaced laterally from and extending parallel to an edge of said central section.

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