Oct. 2, 1934. W. B. EVANS ET AL 1,975,262

SWING SEAT

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FIG 1

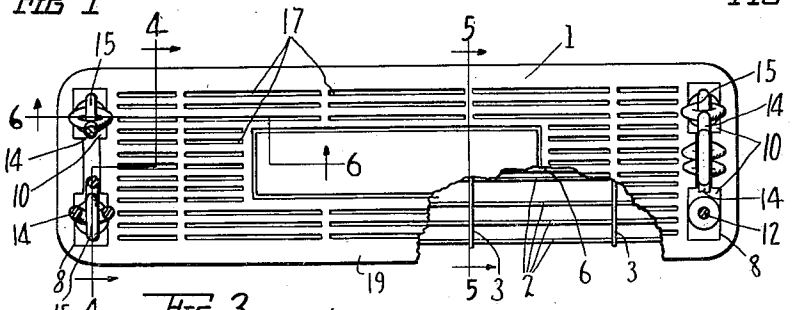


FIG 2

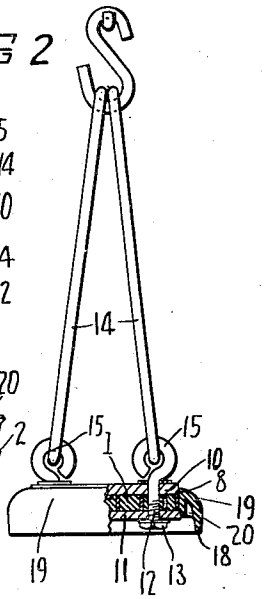


FIG 3

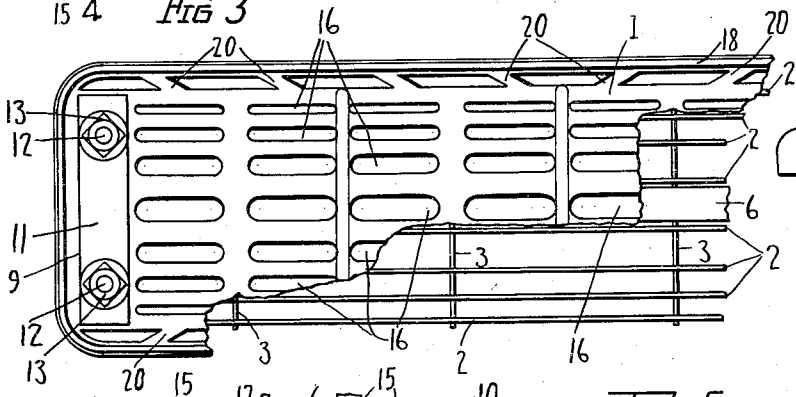


FIG 4

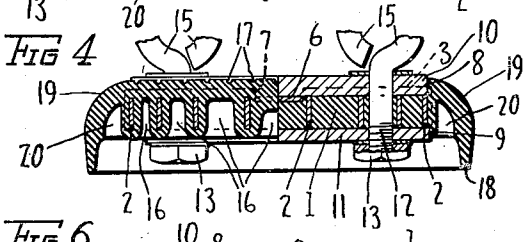


FIG 5

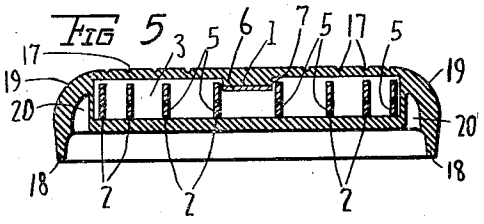


FIG 6

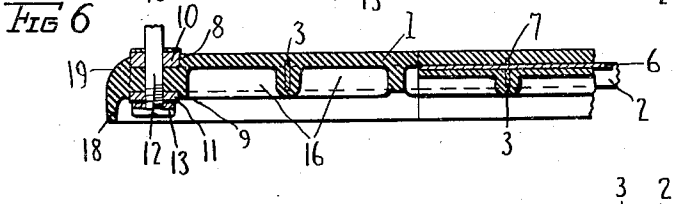


FIG 7

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FIG 8

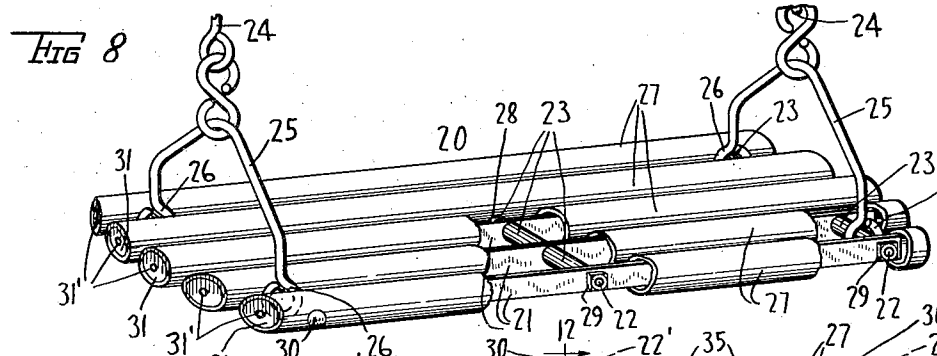


FIG 9

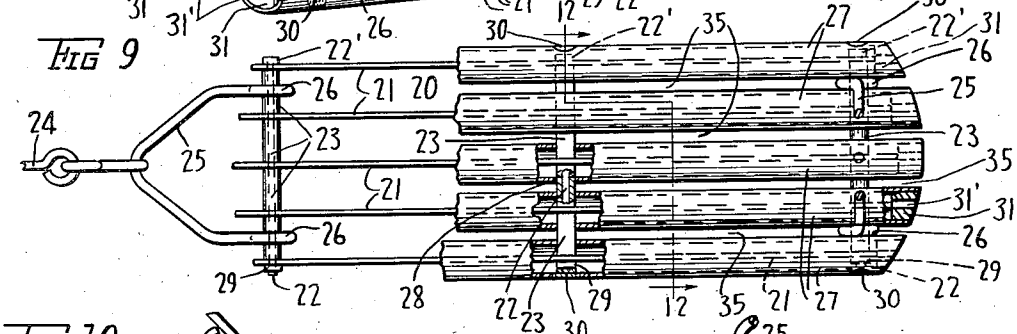


FIG 10

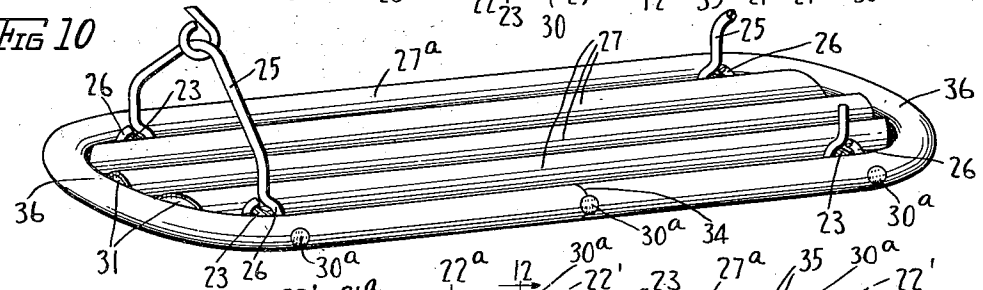


FIG 11

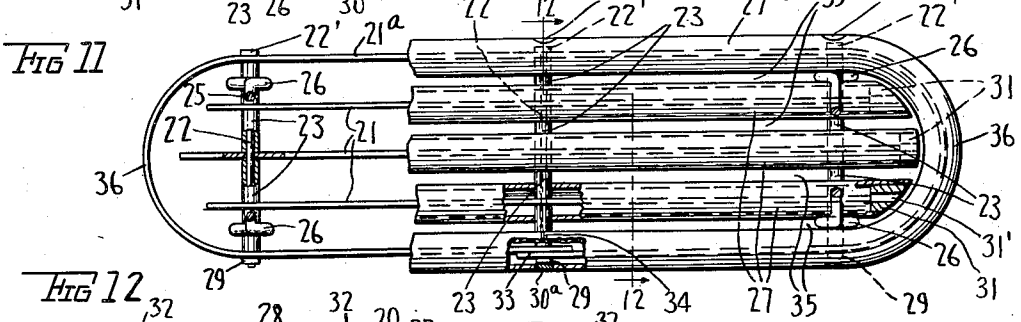
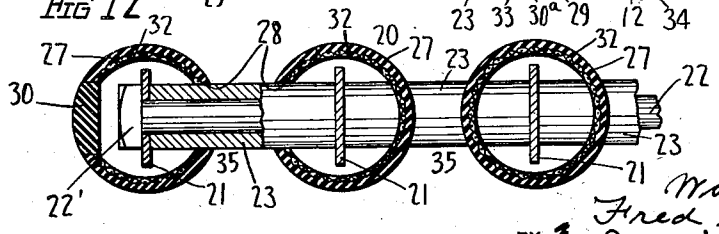


FIG 12



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1,975,262

SWING SEAT

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Application February 8, 1933, Serial No. 655,794

15 Claims. (Cl. 155—58)

This invention relates to improvements in seat board construction and more especially to improvements in playground swing seats.

An object of the invention is to provide a swing seat of vulcanized rubber so reenforced as to prevent vertical bending and also to resist lateral torsional strains; also, to provide a seat which will be light in character and economical in manufacture.

Another object is the provision of a seat which will withstand the action of the elements for a longer period than wooden seats.

Other objects and advantages will appear from the accompanying specification and claims.

In the accompanying drawings:

Fig. 1 is a top plan view of the seat partly broken away to show the reenforcing structure and also the hangers for same partly broken away and shown in section.

Fig. 2 is a view largely in end elevation and partly in transverse section of the seat, showing one of the hangers.

Fig. 3 is a fragmentary bottom plan view of the seat on an enlarged scale with a portion thereof broken away to show the reenforcing frame work.

Fig. 4 is an enlarged transverse section on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged transverse section on the line 5—5 of Fig. 1.

Fig. 6 is a fragmentary longitudinal section on the same scale as Fig. 2, the section being taken on the line 6—6 of Fig. 1.

Fig. 7 is a partial view in perspective on the same scale as Fig. 2 showing the metallic reenforcing parts.

Fig. 8 is a perspective view of a modified form of seat comprising sections of resilient tubing reenforced by a metallic structure, portions of the tubing being broken away to show the reenforcing members.

Fig. 9 is a top plan view of the seat illustrated in Fig. 8, with portions of the tubing material broken away to show the reenforcement members in top plan, and also with portions of the members broken away to show details of the construction thereof.

Fig. 10 is a perspective view of another modified form of reenforced seat with slight differences in construction as compared to Fig. 8.

Fig. 11 is a top plan view, similar to Fig. 9, of the seat shown in Fig. 10.

Fig. 12 is a fragmentary enlarged transverse section showing a detail of construction common to both the modified forms of seat, the section being taken on the lines 12—12 of Figs. 9 and 11.

Referring to Figs. 1 to 7, inclusive, of the drawings, the vulcanized rubber portion of one form of the seat is indicated at 1. Obviously, such material does not have sufficient strength for the purposes for which it is intended and, therefore, a reenforcing structure is provided which in being molded in the seat is entirely enclosed by the rubber whereby no projecting corners or edges are exposed to cause possible injury.

The reenforcing structure is formed in the following manner. Referring to Fig. 7 longitudinal strips 2 are maintained in spaced apart parallel relation by transversely disposed strips 3, each strip 2 and 3 being so arranged as to have the width dimension in the vertical plane whereby resistance to bending from the weight of the user is provided. The longitudinal strips 2 and the cross-strips 3 are placed in intersecting and interlocking relation with each other by notching each strip 3 at proper intervals with notches 5 as shown in Fig. 5, the notches 5 extending into the body of the strip 3 a distance equal to the width of a longitudinal strip 2. Further stiffness is provided by the use of a flat metallic strip 6 placed in the notches 7 in the central portion of the upper edges of the cross-strips 3 (Figs. 5 and 7) and after assembly, the entire structure may be made into an integral unit by welding or soldering.

Cavities are provided in the mold elements bearing the same general relation to each other as do the strips 2 and 3. These cavities are wider and deeper than the strips and thereby provide for the enclosure of the strips in the vulcanized material. In molding, one of the mold elements is partly filled with raw, unvulcanized stock, the reenforcing element is positioned therein at the proper depth. It will be seen that when the remainder of the necessary uncured stock is applied and the mold closed, the cured seat will entirely enclose the reenforcing structure and be greatly strengthened thereby.

It is desirable, however, to so attach the seat to the suspension means so that the weight of the user is transmitted from the reenforcing structure directly to the suspension means. Provision is made to accomplish this feature by forming the mold elements so that other cavities are provided in the finished seat near each end in both the upper and lower surfaces thereof. These cavities are transversely disposed, being at right angles to the longitudinal strips 2 and referring to the upper cavities, of which a portion of one is shown at 8 (Figs. 4 and 6) it is seen that each of these cavities extends downwardly to and exposes

the upper edges of the ends of the longitudinal strips 2. In the same manner, referring to the lower cavities, a portion of which is likewise shown at 9 in the same figures, it is also seen that these cavities extend upwardly to and expose the lower edges of the ends of the same strips 2.

Into each of these cavities 8 and 9 is placed a flat apertured metallic member. The members applied in the upper cavities are alike, one being fully shown in perspective at 10 in Fig. 7. One of the members which is applied in the lower cavities 9 of the lower surface is also seen in perspective in Fig. 7 at 11. The apertures in the members 10 and 11 are located near the ends of the members and when the members are in place are in alignment with openings in the seat produced at the time of molding by properly positioned core members in the mold elements, and through each of these openings and the apertured members the threaded shank 12 of an eye bolt is passed (Fig. 4). The cored openings are located so as to pass between the ends of certain pairs of the longitudinal strips 2, the particular ends referred to being denoted by the character 2' at the left end of Fig. 7. It will then be seen that when the nuts 13 with which the eye bolts are provided are tightened, the ends of the longitudinal strips 2 will be tightly clamped between the upper and lower members 10 and 11, and the weight of the user will be transmitted directly to the suspension members.

In the present drawings, a portion of a suspension member is shown in elevation in Fig. 2, in which view there is seen a pair of links 14 having eye-ends at each end. The lower ends of the links 14 hook into the eye portion 15 of the eye bolts placed in the ends of the finished seat.

The weight of the finished seat is kept to a low degree by molding deep pockets in the bottom surface of the seat wherever possible, as at 16 (Fig. 3). These pockets are comparatively long and narrow, extending between the rim-like portions surrounding the strips 2 and 3 of the reenforcing structure. In the upper surface of the seat are numerous long shallow grooves 17 whose primary purpose is to provide a somewhat roughened surface whereby slipping of the user is prevented, although such grooves also act to lighten the seat body weight.

Protection against injury to users occasioned by being struck by the seat is obviated not only by forming the seat of rubber, as has been mentioned, but also by the fact that the entire outer edge of the body of the seat is formed in a manner wherein a skirt 18 is provided. The skirt 18 is comparatively thick adjacent the body of the seat, and projects from the body in a curve 19 of comparatively large radius, and is integrally attached at spaced intervals along the long sides of the seat, where a large portion of the user's weight is imposed on the edge by diagonally disposed ribs 20, several of which are seen in the bottom plan view, Fig. 2. These diagonally disposed ribs do not entirely rob the rounded edge of its inherent resiliency, for when pressure is applied at or near a rib, the skirt tends to move laterally with the rib, since in effect the rib is hingeably connected with the skirt and the body of the seat. The skirt 18 is extended downwardly a sufficient distance to protect the user against ordinary contact with the lower ends of the eye bolts and the nuts thereon, as seen in Fig. 4, and at this depth the thickness is reduced to provide a high degree of resiliency.

In Figs. 8 to 12, inclusive, are shown two modified forms, one of which is indicated in general at 20, Figs. 8, 9 and 12. In the present instance, the frame of the seat 20 is composed of a metallic frame, consisting of a plurality of longitudinal strips 21 tied together by spaced apart transversely disposed tie-bolts 22 and hollow spacers 23, suspended from hangers 24, fragments of which are indicated only in Fig. 8, through the medium of U-shaped clevices 25 having their lower free ends formed into eyes 26 which encircle the tie arrangements at the ends of the seat frame. The free ends of each clevice are spread apart sufficiently to occupy positions between outermost pairs of the longitudinal strips 21, as shown in Fig. 9, wherein the clevice at the left hand end of the view is shown swung to a horizontal plane to better illustrate the manner of connecting the clevice with the frame. One of the specific advantages obtained by the use of this particular form of seat is that the seat may be inverted. In the event of wear or damage to one side, the other side may be brought into use by detaching the clevices from the hanger members, swinging the clevices through a half revolution, inverting the seat and again attaching to the hangers.

In the present drawings, three tie arrangements are employed to tie the metallic frame-work together. The bolts are inserted through aligned openings in the flat strips with the hollow spacers interposed on the bolts between the several strips whereby the strips are maintained in parallel relations with each other. When suspended in the manner as described it will be clear that the strips 21 will withstand bending in the vertical plane because of the edgewise disposition of the strips, and that also it is possible to provide for a certain desired degree of flexibility whereby bending in the horizontal plane is permitted, for reasons which will appear later.

Protection for the user is afforded by enclosing each of the longitudinal strips 21 in a length of resilient tubing somewhat longer than the strip which it encloses. The tubing sections 27 are placed on the strips at the time of assembly of the seat, and to accommodate the insertion of the bolts and spacers, each tubing section is provided with diametrically opposed openings 28 in the walls thereof (Fig. 12) of the same diameter as the spacer, and spaced apart the same as the tie arrangement spacing. Thus, to assemble the seat, a strip 21 is inserted in a section 27 of tubing with the openings in the strip aligned with the openings 28 in the walls, and a bolt 22 is inserted in each of the openings in the strip through the wall openings 28, which will provide that the bolt head 22' will be concealed within the tubing. On the projecting body portions of each of the bolts a hollow spacer 23 is now slipped, and the lower ends of each of the spacers are inserted through the openings 28 in the tubing wall and comes to rest against the flat side of the strip 21. The remainder of the assembly is a repetition of the operation described and when the desired width is reached, a nut 29 is threaded on each of the ends of the bolts and the frame work drawn tightly together, after which the exposed openings 28 in the outermost side walls are plugged as indicated at 30, Fig. 12. Each end of each tubing section is plugged by means of a plug 31 of resilient material such as rubber having an axial opening 31'. Protection is thereby afforded against injury from the ends of the metallic strips, while the openings allow a free circulation of air through the interior of

the tubing sections, and thereby reduces the tendency toward deterioration of both the metallic parts and the tubing. It is preferable that the resilient tubing be of the type in which one or more circumferentially disposed layers of fabric are imbedded in the walls, whereby protection against the cutting through the walls of the strips is prevented. A layer of fabric is indicated conventionally at 32, Fig. 12.

A form having a further modification is shown in Figs. 10 and 11, and parts common to the first mentioned form have the same reference characters. The reenforcing structure is practically the same as that shown in Figs. 8 and 9 with the exception that the outermost strips of the latter mentioned form is replaced by a single strip 21^a sufficiently long to extend entirely around the seat and to provide an overlapping joint 33 at one of the tie-bolts, here shown as the central bolt 22^a. The tubing which acts as a protection against injury by this strip 21^a is also a single piece tubing 27^a, extending around the seat, the ends being in an abutting relation at the center of the central tie-bolt 22^a as seen at 34, Figs. 10 and 11. As in the case of the first described modification, the exposed side wall openings through which the tie-bolts are inserted are plugged by plugs 30^a similar to the plug shown at 30, Fig. 12, which shows a transverse sectional view common to both the modified forms.

In each of the modified forms, the length of the spacers is such that when assembled, a space 35 will be provided between the parallel tube sections. This is for the purpose of providing that the outermost tube section will be free to bend inwardly in the horizontal plane to a certain degree, whereby the user is protected from possible injury when struck by the swing, it being clear that a blow from such a cause is not so severe as would happen when the tube sections are closely adjacent one another. The outermost strip 21^a and tubing section 27^a covering the same are bent to form semi-circular ends 36 for the seat as shown in Fig. 11, and the ends of the interiorly disposed shorter sections are plugged as described in connection with the plugs 31.

Having thus described our invention, we claim:

1. In a swing seat, a structure comprising a plurality of longitudinal metallic members arranged in the same horizontal plane and in parallel relation, means spacing the metallic members and rigidly interconnecting the same, a covering of resilient tube-like material applied to each metallic member, said means extending through said coverings.

2. In a swing seat, a skeleton metallic structure consisting of a plurality of metallic strips, tie-members connecting said strips, means to hold said strips in spaced relation, and a tube-like resilient member covering each strip.

3. In a swing seat, a reenforcing structure consisting of a plurality of metallic strips, a plurality of tie-members connecting said strips, spacing sleeves on said tie-members between said strips, and a tube-like resilient covering applied to each strip.

4. In a swing seat, a reenforcing structure consisting of a plurality of metallic strips, tie-members connecting said strips, means to hold said strips in spaced relation, a tube-like resilient member covering each strip, and suspension members connected with said tie-members.

5. In a swing seat, a reenforcing structure consisting of a plurality of metallic strips, a plurality of tie-members connecting said strips, spacing sleeves on said tie-members between said strips, a tube-like resilient covering applied to each strip, and suspension members connected with certain of said spacing sleeves.

6. In a swing seat, a reenforcing structure consisting of a plurality of metallic strips, a plurality of tie-members connecting said strips, a tube-like resilient covering applied to each strip, and suspension members rotatable for at least a half-revolution pivotally connected with certain of said tie-members between adjacent coverings.

7. In a swing seat, a plurality of reenforcing strips, means to connect said strips and hold them in spaced parallel relation, a rounded connection between the outermost strips at the respective ends thereof, and resilient tube-like members covering said strips and said rounded connections.

8. In a swing seat, a reenforcing structure consisting of a plurality of longitudinal strips, tie-members connecting the same, sleeve-like spacers on said tie-members to hold the strips in spaced parallel relation, and a resilient tube-like covering for each strip, said covering having aligned openings to receive said tie-members and spacers.

9. In a swing seat, a reenforcing structure, a covering for said structure consisting of a plurality of open-ended tube-like members of resilient material, each tube-like member being applied to a part of said structure so as to encase the same, and an apertured plug in the open ends of each tube-like member.

10. In a swing seat, a reenforcing structure consisting of a plurality of longitudinal strips, tie-members connecting the same, sleeve-like spacers on said tie-members to hold the strips in spaced parallel relation, a resilient tube-like covering applied to each strip, said covering having aligned openings receiving said tie-members and spacers, and plugs formed of resilient material within certain of said aligned openings, and axially apertured plugs formed of resilient material within the open ends of said tube-like coverings.

11. In a swing seat, a reenforcing structure consisting of a plurality of comparatively thin parallel metallic strips disposed in a direction transversely of the path of movement of the seat, the width dimension of each strip being disposed in a vertical plane when the seat is at rest, a plurality of tie rods extending through the strips transversely to the direction of the length of the same, cylindrical spacing sleeves on said tie rods between said strips each having a uniform outside diameter, and a cylindrical resilient covering applied to each strip perforated to receive the tie rods and spacing members.

12. In a swing seat, a reenforcing structure consisting of a plurality of comparatively thin parallel metallic strips disposed in a direction transversely of the path of movement of the seat, the width dimension of each strip being disposed in a vertical plane when the seat is at rest, a plurality of tie rods extending through the strips and extending transversely to the direction of the length of the same, cylindrical spacing sleeves on said tie rods between said strips each having a uniform outside diameter, a cylindrical resilient covering applied to each strip perforated to receive the tie rods and spacing members, and a yoke-shaped suspension member connected to each end tie rod between adjacent coverings.

13. In a swing seat, a structure comprising a plurality of metallic members, means spacing said

metallic members and rigidly interconnecting the same, a covering of resilient material applied to each metallic member, said covering having initially formed openings to receive said members, a part at least of said means extending through said coverings, said metallic members being so disposed that the upper surfaces of the coverings will be arranged in the same horizontal plane.

14. In a swing seat, a structure comprising a plurality of longitudinal metallic members, means spacing said members and interconnecting the same, a covering of resilient material for said metallic members having initially formed openings through which said members extend, a part at least of said means extending through said covering.

15. In a swing seat, a structure comprising a plurality of longitudinal metallic members arranged in the same horizontal plane, means spacing said metallic members and interconnecting the same, a covering of resilient material applied to each metallic member having an opening through which said member extends, a part at least of said means extending through said coverings.

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