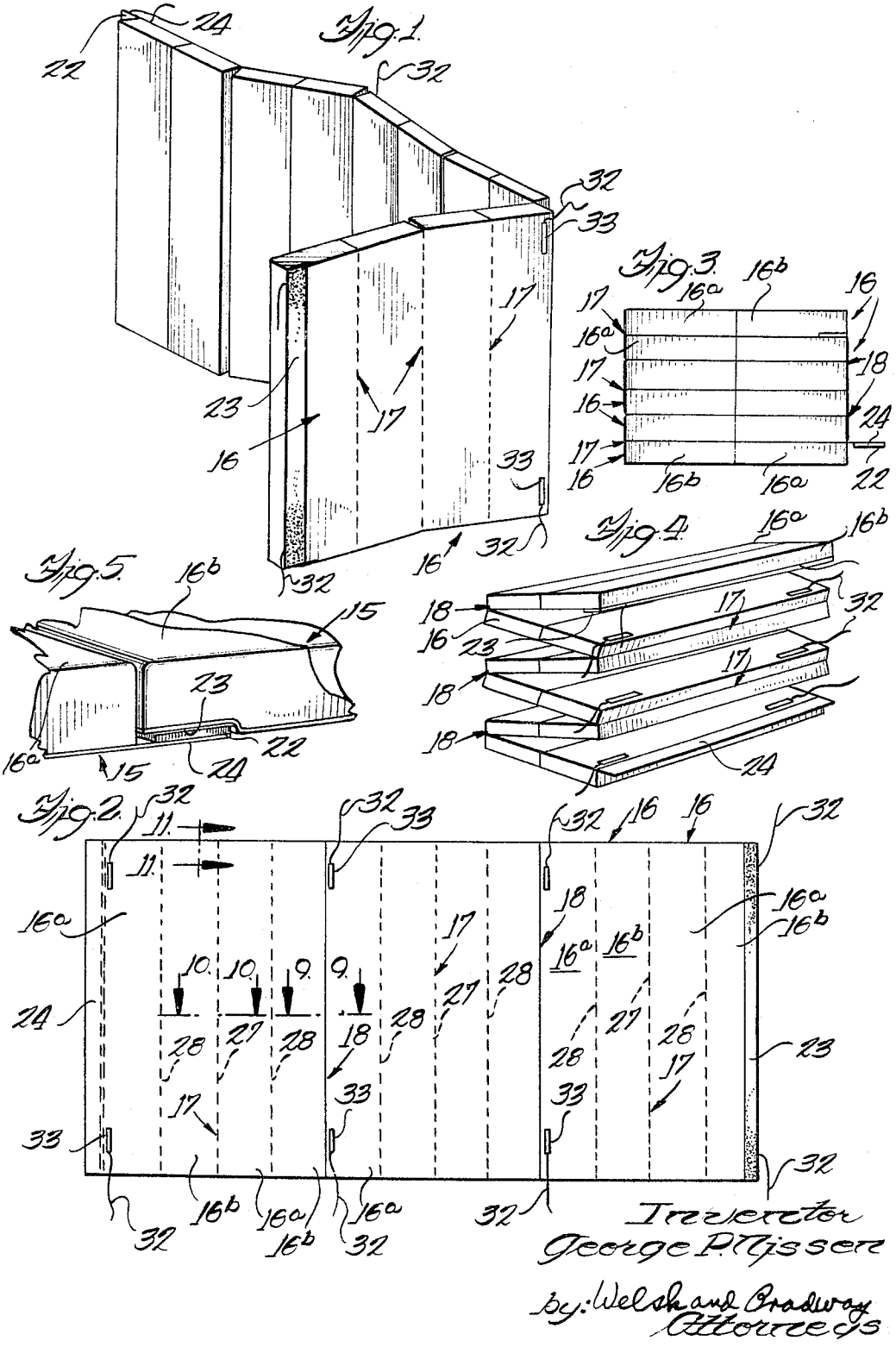
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GYMNASTIC FLOOR COVERING

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Fig. 6.

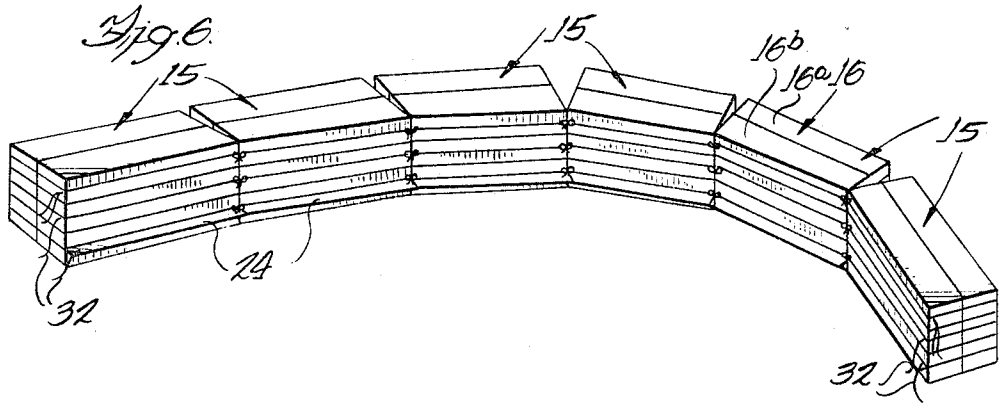


Fig. 7.

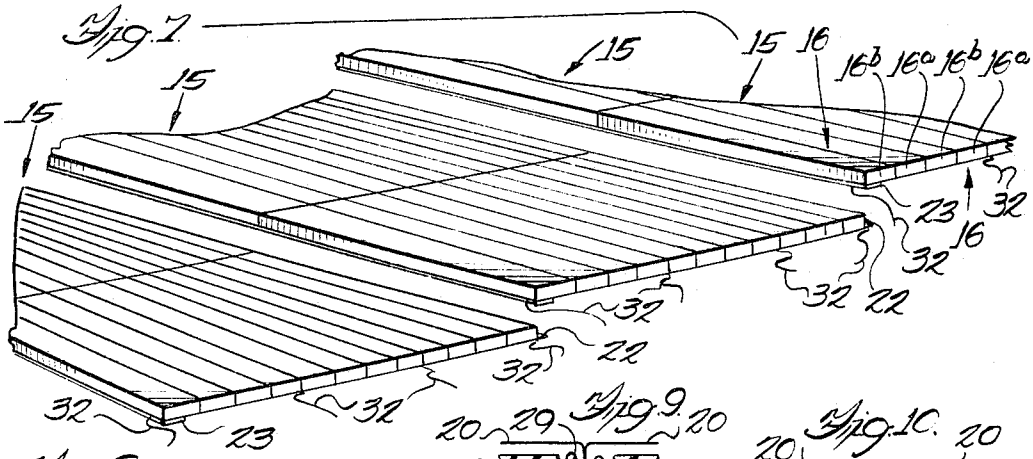


Fig. 8.

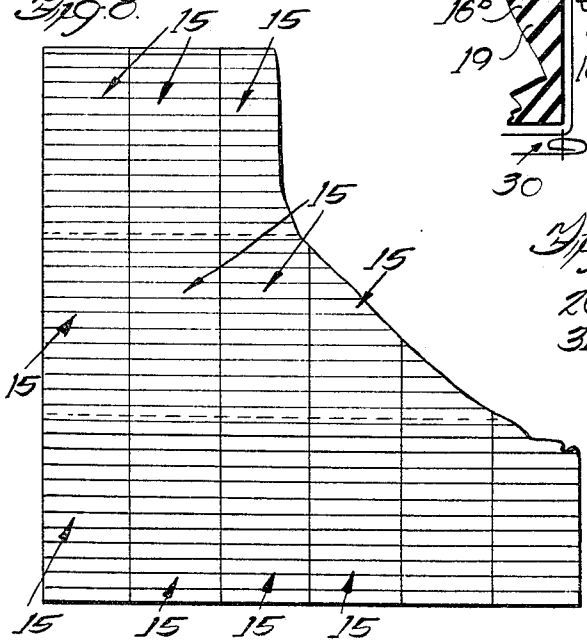


Fig. 9.

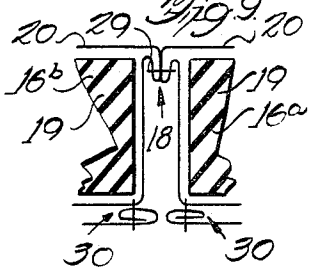


Fig. 10.

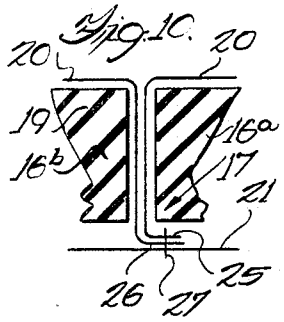
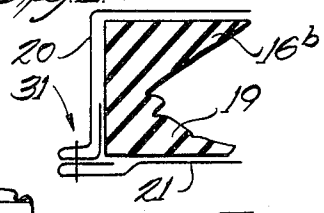


Fig. 11.



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3,284,819

GYMNASTIC FLOOR COVERING

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Filed July 28, 1964, Ser. No. 385,607
5 Claims. (Cl. 5—344)

This invention relates to a gymnastic flood covering or mat made in foldable sections and adapted to be connected to other mats to cover floor areas of different desired sizes. The primary object of the invention is to connect the sections of a gmynastic floor mat of the above character in a novel manner to facilitate storing and handling of the mat.

Another object is to provide novel means for connecting the sections of one mat to sections of other mats in end to end and side to side relation to form floor coverings of various sizes.

A further object of the invention is to connect the sections of each mat in a novel manner enabling them to be folded in accordion fashion for ease of storage.

Still another object is to provide novel connections between adjacent mats enabling them to remain connected in side to side relation while their sections are folded into and out of their accordion storage positions.

Other objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIGURE 1 is a perspective view of a floor covering or mat embodying the novel features of the present invention;

FIG. 2 is a bottom plan view of the floor covering shown in FIGURE 1;

FIG. 3 is an end elevational view of the floor covering in a folded condition;

FIG. 4 is a perspective view of the mat in a semifolded position;

FIG. 5 is an enlarged fragmentary view showing the end to end connection between two mats;

FIG. 6 is a perspective view showing a plurality of folded mats connected in side to side relation;

FIG. 7 is an exploded, fragmentary perspective view showing the attachment of mats which are connected in side to side relation to other sections in end to end relation;

FIG. 8 is a plan view showing a plurality of mats connected in end to end and side to side relation to cover a large floor area; and

FIGS. 9, 10 and 11 are enlarged fragmentary sectional views taken along the lines 9—9, 10—10 and 11—11, respectively, of FIG. 2.

In the drawings, the invention is shown for purposes of illustration embodied in a plurality of mats **15** especially adapted for covering floors in gymnasiums and providing a shock absorbing or resilient surface to protect performers. Each mat comprises a plurality of flat rectangular sections **16** arranged side by side in parallel relation and each connected to and foldable relative to adjacent sections along hinges **17** and **18**. In the present instance, each section is made up of two half sections **16***a* and **16***b* and each half section is formed of a block or body **19** of shock absorbing resilient material enclosed by a covering formed of top and bottom sheets **20** and **21**. While various shock absorbing materials may be used, polyethylene foam is preferred but sponge rubber also has been found satisfactory. A suitable covering material is a canvas or fabric sheet coated with a polyvinyl resin.

To enable each mat **15** to be connected to a similar mat for the purpose of forming a continuous floor covering, fastening elements are positioned along the ends and sides of each mat. All of the fastening elements preferably are located in the plane of the floor side of the mat so that they will be covered by the shock absorbing resilient material when the mat is laid on the floor it is to cover.

In this instance, the fastening elements **22** and **23** at the ends of the mats **15** are of the overlapping gripper type releasable in response to separating forces exerted in a direction generally normal to their plane of overlapping, but resisting separation by forces in the plane of overlapping. To enable the mats to interfit with each other with their opposite ends in abutment without gaps and to locate the end fastening elements beneath the shock absorbing material **19**, one gripper element **22** is located on the upper surface of a tab **24** (FIG. 5) which is an extension of the bottom cover sheet **21** and extends beyond the perimeter of one end section **16***a* of the mat. The complementary gripper fastening element **23** is located at the opposite end of the mat but within the perimeter of the other end section **16***b* of the mat, and is fastened to the underside of covering material of the mat.

Herein, the gripping element **22** on the outwardly projecting tab **24** is a strip of material such as cloth with upwardly projecting barbs or loops. The complementary element **23** at the opposite end of the mat **15** is a strip of cloth with a raised nap. Fastening material of this type is sold under the trade name "Velcro" by American Velcro Inc., having sales offices at 681 Fifth Avenue, New York, New York. The barb section is fastened to the tab with the barbs extending upwardly and the complementary nap portion is attached to the underside of the bottom cover sheet **21** at the opposite end of the mat and faces downwardly so that these portions on adjacent mats engage each other in overlapping relation when the ends of the mats are in abutment.

In accordance with the present invention, each section **16** of the mat **15** is connected to adjacent sections in a novel manner to facilitate storage and transportation of the mat. To this end, adjacent hinges **17** and **18** connecting adjacent sections are located in the different planes of the top and bottom of the mat with alternate hinges in the same plane so that the sections may be collapsed in accordion fashion and in side by side relation to form a rectangle as shown in FIG. 3. In this shape, the mat occupies a minimum space and is convenient to handle.

The bottom hinge **17** between each pair of adjacent sections **16** is formed in a simple and inexpensive manner by using a common bottom cover sheet **21** for the pair of sections and extending the top cover sheet **20** for each half **16***a* or **16***b* of each section around the top and the side and end edges of the block **19** of the half section to the plane of the bottom where it is joined to the bottom cover sheet.

The particular manner of joining the top and bottom cover sheets **20** and **21** to form the bottom hinge **17** is shown in FIG. 10 where, as also appears in FIGS. 9 and 11, the spacing of the parts is exaggerated to show their interrelationship clearly. Referring to FIG. 10, it will be seen that the lower edge **25** of the top sheet of one half **16***a* of one section **16** is bent under the section and the lower edge **26** of the adjacent half **16***b* of the adjacent section is bent under the first section and into overlapping relation with the lower edge portion of the top cover sheet of the first half section. These overlapping edges then are sewn as indicated at **27** to the bottom cover sheet along the junction of the adjacent half sections. A similar construction connects the cover and bottom sheets of the two half sections of each section adjacent their junction as indicated at **28** (FIG. 2).

The top hinges **18** between adjacent sections **16** are formed as shown in detail in FIG. 9. There, portions of the top sheets **20** of the sections **16***a* and **16***b* adjacent

the upper plane of the sections are bent first down, then reversely and finally down again along the side edges of the sections, the first bent down portions and the reversely bent portions being sewn together as indicated at **29** in overlapping relation. At their lower edges adjacent the hinge **18**, the top sheets are simply bent under their respective sections and sewn in overlapping relation to reversely bent end portions of the respective bottom sheets as indicated at **30**. Along the end of each section, that is, along one side edge of the mat, an outwardly and then reversely turned lower edge of the top sheet is sewn to an overlapping inwardly turned edge portion of the bottom sheet as shown at **31** in FIG. 11.

With the foregoing arrangement, each section **16** of each mat **15** is foldable between an extended position in which it lies in a common plane with adjacent sections (FIGS. 2, 7 and 8) and a collapsed position in which it is sandwiched between and lies in a plane parallel to the planes of adjacent sections in accordion fashion (FIGS. 3, 4 and 6). In another aspect, the present invention contemplates a novel construction of the fastening elements at the side edges of each mat to enable the mat to be connected to adjacent mats to cover a floor area larger than that of one mat and to remain connected to the adjacent mats while such adjacent mats are folded into and out of their collapsed or storage conditions. To this end, the side fastening elements **32** connect adjacent mats at points spaced along the length of the mats and located adjacent alternate ones of the hinges **17** and **18** between adjacent sections of each mat. By locating each fastening element adjacent a hinge, adjacent mats may remain connected in side by side relation without interference with the folding of corresponding sections of the two mats relative to each other. Although the fastening elements may be located adjacent each hinge, it has been found sufficient to locate them on the underside of each mat adjacent the upper hinges **18** joining the upper sides of adjacent sections.

While the side fastening elements **32** for each mat **15** may take various forms, each is constructed easily and inexpensively in the present instance as a string having its inner end secured to the underside of the mat adjacent one side edge of the mat and its outer end extending beyond the side edge for tying to a cooperating string projecting from the adjacent mat. The adjacent side edges of adjacent mats are in abutting relation with the cooperating strings along such edges tied together tightly to maintain such abutting relation and avoid spaces between adjacent mats when they are extended and laid side by side on a floor. It is noted also that, in the folded condition of each mat as shown in FIG. 6, all of the strings are located in the same vertical face of the rectangle where they are easily accessible for tying to strings of adjacent mats or for being untied.

Herein, each string **32** is a strip of the same material as the bottom cover sheet **21**. At the end of the mat adjacent the nap fastener **23**, the strips **32** are sewn under the nap. At the other points on each mat, the inner end portion of each strip is wrapped by several layers **33** of the same material which are sewn to the underside of the bottom cover sheet with the strip to secure the strip to the sheet and protect the strip against tearing upon contact with the floor. There are the same number, in this instance, four, strings located in similiar positions along each side of the mat at the ends and beneath the upper hinges **18**.

It will be apparent that with adjacent hinges **17** and **18** of each mat **15** located in the upper and lower planes of the top and bottom surfaces of each mat, the sections **16** may be folded one on the other in accordion fashion to form a compact rectangle for storage. When it is desired to cover an area larger than one mat, a plurality of mats may be secured together easily in end to end or side by side relation as desired to cover a selected size and shape of floor area. To secure adjacent mats together end to end, the mats are aligned longitudinally and the strip **23** of the raised nap on the underside of one end of one mat is simply laid on the barbed strip **22** projecting from the adjacent end of the other mat with the ends abutting each other. Any number of mats may be secured end to end in this manner, three being shown in FIG. 8 for purposes of illustration.

Two mats **15** are secured together in side by side relation simply by aligning the ends of the mats and tying the strings **32** of one mat to corresponding strings of the other mat with the side edges of the two in close abutting relation. Any number of mats may be secured side by side in this fashion, six being shown in FIG. 8. Due to the spacing of the strings along the length of the mats adjacent the hinges **18**, the strings may remain tied together to continue to connect adjacent mats while their sections **16** are folded into the storage positions as shown in FIG. 6. Similarly, while they remain connected by the strings, adjacent sections may be unfolded easily from their storage positions to lie in the same plane.

I claim:

1. A gymnastic floor covering of generally flat rectangular shape comprising a plurality of flat rectangular blocks of resilient shock absorbing material, a plurality of top cover sheets each covering an individual block, a plurality of bottom cover sheets each covering a set of two pairs of adjacent blocks, each of said top cover sheets being attached to a bottom cover sheet around the bottom edge of a block to hold the block in position on the bottom cover sheet, one pair of said adjacent blocks on each of said bottom cover sheets being swingable relative to the other pair about the bottom cover sheet and between a first limit position in which the top and bottom surfaces respectively of the blocks lie in the same planes and a second limit position in which the bottom sides of the blocks are adjacent each other, each set of two pairs of blocks being attached to an adjacent set of two pairs of blocks along the top side edges of adjacent blocks of the two sets for folding into overlapping positions in which the top surfaces of one set lie against top surfaces of adjacent sets.

2. A gymnastic floor covering of generally flat rectangular shape comprising a plurality of flat rectangular sections arranged side by side and joined to adjacent sections along their side edges by hinge connections, said hinge connections being alternately located in the planes of the top and bottom surfaces of the sections to permit the covering to be folded in an accordion manner and into a compact rectangle in which the top and bottom surfaces of the blocks are located in parallel planes with similar surfaces of adjacent sections facing in opposite directions and similar surfaces of alternate sections facing in the same direction, and side fastening elements attached to said covering at spaced points along the side edges of the covering and engageable with similar elements of a similar covering to secure the coverings in side by side relation, said side fastening elements being located adjacent said hinge connections to permit the sections of the covering to be folded into and out of said compact rectangle while the covering remains connected to a similar covering by the elements.

3. A mat of generally rectangular shape comprising a plurality of flat rectangular sections connected together in side by side relation by hinges which permit adjacent sections to be folded into overlapping relation in accordion fashion, end fastening elements attached to said sections at opposite ends of said mat and engageable with complementary elements on similar mats to connect said mats in end to end relation, and side fastening elements attached to said mat at spaced points along the sides of the mat adjacent said hinges and interfitting with similar elements of adjacent mats to connect the mats in side by side relation while permitting the sections of the mats to be folded into and out of said overlapping relation.

4. A floor covering of generally rectangular shape

comprising a plurality of flat rectangular sections connected together in side by side relation by hinges, said hinges permitting adjacent sections to be folded into overlapping relation in accordion fashion, and a plurality of strings each having one end connected to said covering adjacent a side edge of the covering and having its other end portion projecting laterally and outwardly beyond the side edge for tying to similar strings of an adjacent similar covering to secure the coverings in side by side abutting relation, said strings being spaced along said side edges and located adjacent said hinges to permit folding of said sections of similar coverings into and out of said overlapping relation while the sections remain connected in side by side relation by the strings.

5. A floor covering of generally rectangular shape comprising a plurality of flat rectangular sections connected together in side by side relation by hinges, said hinges permitting adjacent sections to be folded into

overlapping relation in accordion fashion, and side fastening elements attached to said covering at spaced points along the side edges of the covering adjacent said hinges and interfitting with similar elements of a similar covering to connect the coverings in side by side relation while permitting the sections of the two coverings to be folded into and out of said overlapping relation.

References Cited by the Examiner

UNITED STATES PATENTS

836,326	11/1906	Kinyon	5—345
1,393,619	10/1921	Gardner	5—357
2,528,768	11/1950	Marsh	5—352
2,548,547	4/1951	Melrose	5—357

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