

Aug. 10, 1937.

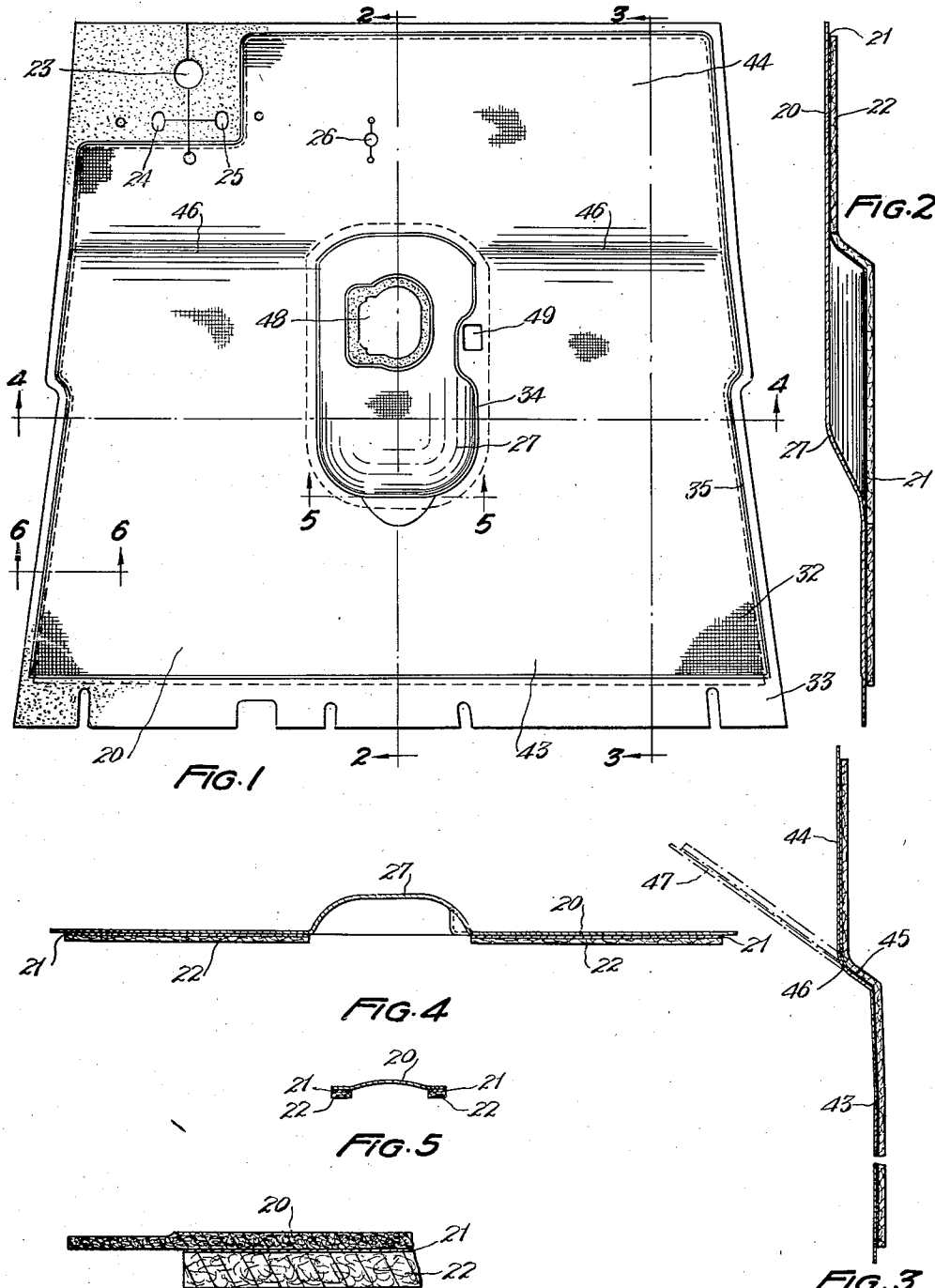
G. F. CAVANAGH ET AL

2,089,598

FLOOR MAT

Filed Sept. 27, 1933

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

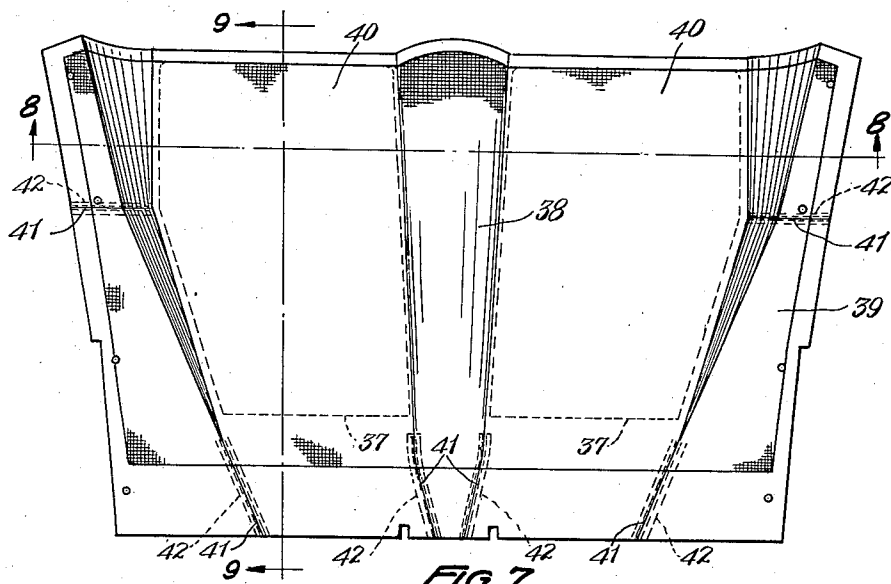


FIG. 7

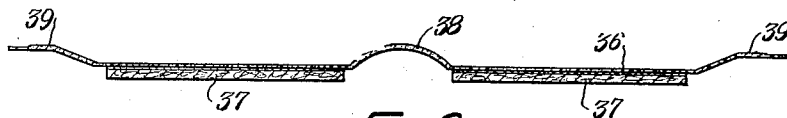


FIG. 8

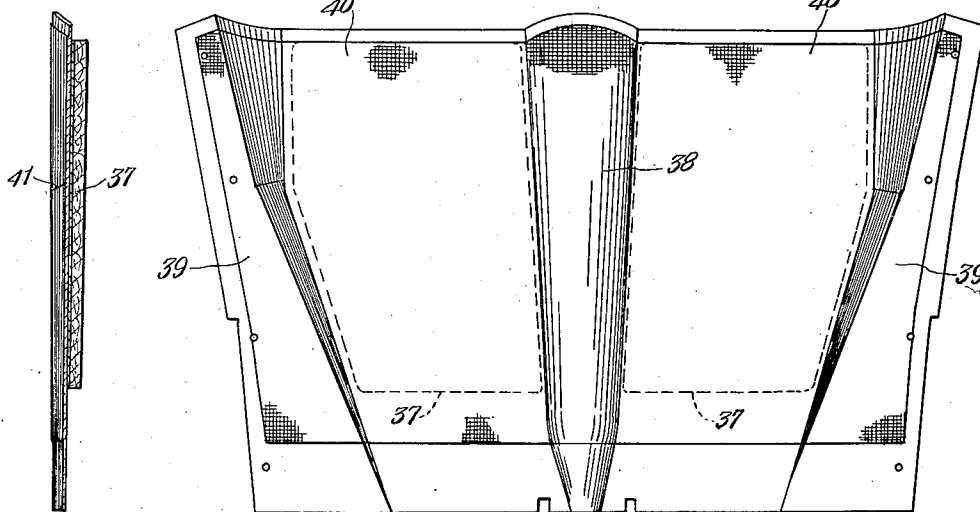


FIG. 9

FIG. 10

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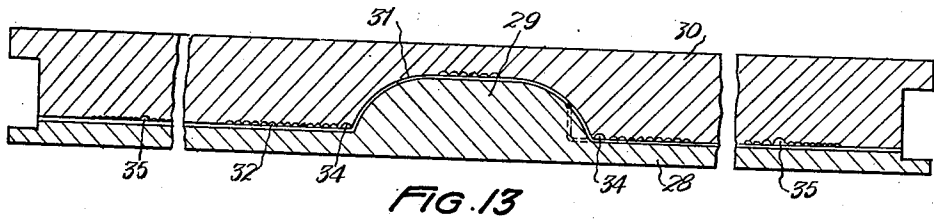


FIG. 13

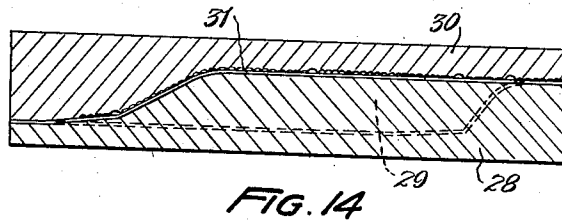


FIG. 14

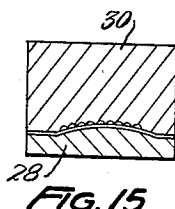


FIG. 15

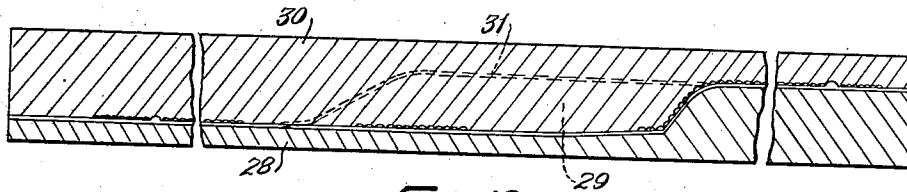


FIG. 16

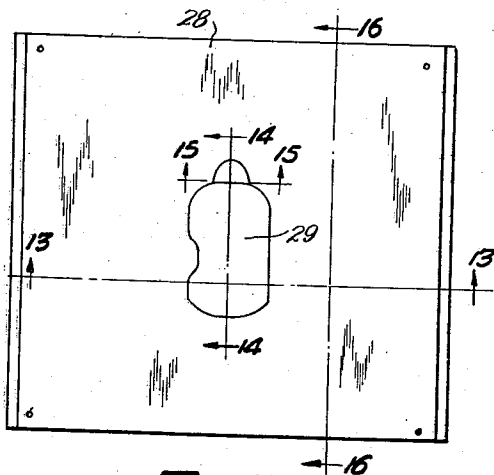


FIG. 11

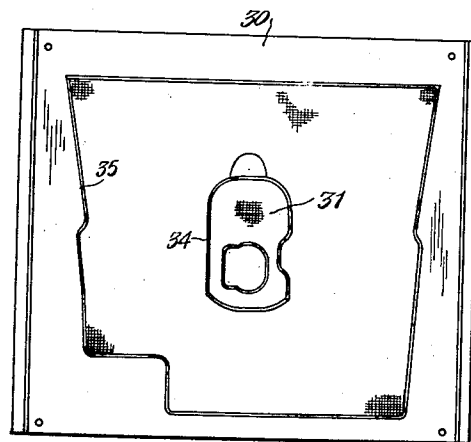


FIG. 12

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2,089,598

FLOOR MAT

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Application September 27, 1933, Serial No. 691,166

4 Claims. (Cl. 154—49)

This invention relates to floor mats for vehicle compartments, and the like, and also to a novel method of making floor mats.

An object of this invention is to provide a mat for a vehicle compartment having floor irregularities, such mat comprising a wear sheet of fibrous material treated with a binding agent and having portions thereof preformed so as to conform substantially to the floor irregularities while other portions of the mat conform to the general plane of the compartment floor.

Another object of this invention is to provide a mat for a vehicle compartment having floor irregularities, such mat comprising a flexible wear sheet having portions thereof preformed to overlie and conform substantially to the floor irregularities, and a fibrous backing extending over and attached to the under surface of other portions of the wear sheet.

It is also an object of this invention to provide a novel method of making floor mats which comprises treating a wear sheet of fibrous material with a binding agent and then applying pressure to the sheet and thereby shaping portions of the same to conform substantially with irregularities of the floor on which the mat is to be used.

Other objects and advantages of this invention will be apparent from the following description when taken in conjunction with the accompanying sheets of drawings, wherein—

Fig. 1 is a top plan view showing a vehicle floor mat constructed according to our invention;

Fig. 2 is a longitudinal sectional view thereof taken on line 2—2 of Fig. 1;

Fig. 3 is another longitudinal sectional view taken on line 3—3 of Fig. 1;

Figs. 4, 5 and 6 are transverse sectional views taken as indicated by the corresponding section lines of Fig. 1; Fig. 6 being on an enlarged scale.

Fig. 7 is a top plan view of another vehicle floor mat constructed according to our invention;

Fig. 8 is a transverse sectional view thereof taken on line 8—8 of Fig. 7;

Fig. 9 is a longitudinal sectional view taken on line 9—9 of Fig. 7;

Fig. 10 is a top plan view of another vehicle floor mat constructed according to our invention;

Fig. 11 is a plan view of a bottom mold or die member used in carrying out our invention;

Fig. 12 is a plan view of the corresponding upper die or mold member;

Fig. 13 is a transverse sectional view showing

the mold members in cooperating relation and taken substantially as indicated by the line 13—13 of Fig. 11; and

Figs. 14, 15 and 16 are sectional views of the cooperating mold members taken as indicated by the corresponding section lines on Fig. 11.

In the accompanying drawings to which detailed reference will now be made, we have shown an improved form of mat for use in vehicle compartments having floor irregularities, and have also shown cooperating mold or die members which may be employed in constructing such floor mats in accordance with our novel method herein disclosed. It will be understood, of course, that our invention may be embodied in various forms of mats other than those which are illustrated and described, and likewise, that our method may be used in the production of various forms of mats.

In Figs. 1 to 6 inclusive of the drawings, we have shown our novel floor mat as a mat intended for the front compartment of a motor vehicle, and, in general, this mat comprises an upper wear sheet 20, and a backing layer 21 which is connected to and extends over portions of the under surface of the wear sheet.

The wear sheet 20 is of a flexible and yielding nature and may be formed of various kinds of material. For this upper wear sheet we prefer to use felted animal hair or fibers formed into sheets and felted in any of the usual ways. This wear sheet is impregnated with a waterproof binding agent which improves the wearing qualities and increases the compactness of the felted fibrous material. As such binding agent, any suitable binder or adhesive may be used, such as tapioca adhesive to which latex may or may not be added.

The backing layer 21 likewise may be formed of various materials, such as sponge rubber or felted fibrous material, or the like. When felted fibrous material is used for this layer, it may comprise loosely felted animal hair or jute felt, or may be any of the commercial forms of felt which may or may not be needled to a layer of burlap, paper, or the like, to give the felted material the desired tensile strength for handling without fraying. In the drawings, this reinforcing layer of the felted backing material is represented by the reference character 22, and in this instance is on that surface of the felted layer which is connected to the under side of the wear sheet 20 although, if desired, this reinforcing layer might be at an intermediate plane in the felted layer.

As mentioned above, the mat illustrated in Figs. 1 to 6 inclusive is a mat for the front compartment of a motor vehicle and, as shown in Fig. 1, is of such size and shape that its perimeter or outline corresponds substantially with the perimeter or outline of the floor of the compartment. Suitable openings may be provided in the mat to accommodate the usual vehicle controls, such as the opening 23 for the steering column, the openings 24 and 25 for the clutch and brake pedals, and the opening 26 for the starter button.

It is not uncommon for the floors of motor vehicle compartments to have irregularities thereon, and usually such irregularities are in the form of parts of vehicle structure extending above the general plane of the compartment floor. Our invention contemplates the provision of a floor mat having portions thereof preformed to overlie and conform substantially to such irregularities while other portions of the mat conform to the general plane of the compartment floor. In the case of the floor mat illustrated in Figs. 1 to 6 of the drawings, we have, by way of example, shown this floor mat as having an upwardly bulged central portion 27 which is preformed so as to overlie and conform substantially with a similarly shaped part of the vehicle structure projecting above the general plane of the compartment floor. The upwardly projecting part of the vehicle structure constituting the floor irregularity may be different in different vehicle constructions. For example, it may be a gear housing or some other part of the vehicle structure.

In preforming a portion of the mat so as to conform to the floor irregularity, various methods may be followed, but we have found that by first treating or impregnating the fibrous wear sheet 20 with the binding agent mentioned above and then pressure-forming the sheet between suitably shaped cooperating die or mold members, the desired portions of the wear sheet are stretched and shaped to conform to the floor irregularities and that such preformed portions of the mat retain their shape when the mat is removed from the mold members and thereafter during the use of the mat on the compartment floor of the vehicle.

In Figs. 11 to 16 inclusive, we have shown mold members which may be used in the production of the floor mat illustrated in Figs. 1 to 6, and in this instance these members comprise a bottom mold member 28 having an upwardly bulging protuberance 29 corresponding in shape and location substantially with the shape and location of the floor irregularity, and an upper mold member 30 having a recess 31 which corresponds to and receives the protuberance 29 when the mold members are arranged one above the other as shown in Figs. 13 to 16 inclusive. If desired, the upper surface of the floor mat may be formed with a patterned area 32 having any suitable design impressed thereon, and with a border area 33 surrounding the patterned area and which may be smooth surfaced or provided with a design or configuration different from that of the patterned area 32. Likewise, the preformed portion 27 of the mat may have a pattern or configuration impressed thereon, and, if desired, upstanding beads 34 and 35 may be formed on the surface of the mat around the preformed portion and around the patterned area, as shown in Fig. 1.

In carrying out our method, the wear sheet of

fibrous material, after being treated with the binding agent, is placed between the cooperating mold members 28 and 30, and by bringing these members together to the position shown in Figs. 13 to 16, the wear sheet is subjected to pressure, with or without the application of heat, and portions of the wear sheet are drawn or stretched by the entry of the protuberance 29 into the recess 31. The pressure applied to the wear sheet between the mold members also impresses the pattern or configuration on the upper surface of the mat and also forms the upstanding beads 34 and 35.

In carrying out this pressure-forming operation, the mat is preferably allowed to remain in the mold long enough for the binding agent to become set or solidified so that when the mat is removed from the mold it will retain the shape which has been imparted thereto. If desired, the fibrous backing layer 21 may be attached to the under surface of the wear sheet 20 during the pressure-forming operation just described but we prefer to carry out our method by first forming the wear sheet 20 by the pressure-shaping operation and then attaching the backing 25 layer 21 to the under surface of the wear sheet by suitable attaching means, such as a cement or adhesive, after the wear sheet has been removed from the mold.

In Figs. 7 to 10 inclusive, we have shown other forms of mats constructed according to our invention so that portions of these mats conform to and overlie floor irregularities, while other portions of the mats conform substantially to the general plane of the floor. The mats shown in Figs. 7 and 10 are of a size and shape suitable for the rear compartment of a motor vehicle, and the outline or perimeter of these mats is such as to conform to the outline or perimeter of the floor of the vehicle compartment. Each of these mats is of a construction similar to that already described in connection with the mat illustrated in Figs. 1 and 2, that is to say, these mats are provided with an upper wear sheet 36 of treated fibrous material, corresponding with the upper wear sheet 20 of Figs. 1 and 2, and a fibrous backing layer 37 attached to portions of the under surface of the wear sheet 36 and corresponding with the backing layer 21.

According to our invention, the mats shown in Figs. 7 and 10 are constructed with an intermediate portion of the wear sheet 36 preformed to provide an elongated upward bulge 38, and with opposite side portions of the wear sheet 36 preformed so as to extend upwardly and outwardly, as indicated at 39 in the drawings. The longitudinal bulge 38 overlies and conforms substantially to a portion of the vehicle structure extending above the general plane of the compartment floor and, likewise, the upwardly and outwardly preformed portions 39 of the wear sheet extend over and conform substantially to portions of the vehicle structure located at the sides of the vehicle compartment and which extend above the general plane of the compartment floor. The portions 40 of the mat lying between the longitudinal bulge 38 and the upwardly and outwardly extending side portions 39, are substantially flat and conform to the general plane of the compartment floor.

The fibrous backing layer 37 may be made to extend over the entire under surface of the wear sheet 36, but it is usually desirable that the backing layer extend over only those portions of the wear sheet which lie between the preformed

portions and above the generally flat portions of the floor surface, as shown in Figs. 7 to 10 inclusive.

If desired, a floor mat of the type shown in Figs. 7 and 10 can be constructed according to our invention by preforming the portions 38 and 39 of the mat, during the pressure-forming operation, to the extent necessary to cause these portions to conform to the floor irregularities, but we have found that, in order to avoid buckling of the material of the wear sheet at certain points, or undesirable stretching of this material at other points, it is usually desirable to cut or slit the wear sheet at certain points prior to the pressure-forming operation. This cutting or slitting of the wear sheet may consist in cutting out portions of the sheet at the edges thereof, such as V-shaped notches, which are closed by the shaping of the material during the pressure-forming operation. In Fig. 7 of the drawings we have represented at 41 several of such cuts which have been formed in the wear sheet prior to the pressure-forming operation.

To connect the edges of the cuts and to retain the same in the desired relation during the use of the mat, we stitch strips 42 of suitable connecting material to the under side of the wear sheet so as to overlie and connect the edges of the cuts as shown in Fig. 7.

Another feature of our invention relates to the type of floor mat which is to be used in a vehicle compartment having relatively inclined floor surfaces, such as the front compartment of a motor vehicle which is provided with a substantially horizontal floor part and a relatively inclined toeboard. In describing this feature of our invention, reference is made to the floor mat illustrated in Figs. 1 to 6 inclusive, which is a front compartment mat and which has a portion 43 adapted to overlie the substantially horizontal floor part of the compartment and a portion 44 adapted to cover the toeboard part, when the mat is in position on the floor of the compartment. To reduce the size, particularly the thickness, of the cooperating mold members 28 and 30, and to avoid the need for an excessive separating movement between these mold members, we construct the mold members so that the mat portion 44 lies in a plane which is substantially parallel to the plane of the mat portion 43 during the pressure-forming operation.

In constructing the mat portion 44 in this manner, we utilize a portion of the wear sheet 20 as a connecting portion 45 which connects the mat portions 43 and 44. In pressure-forming the wear sheet, as explained above, one edge or side of the connecting portion 45 is formed or molded at an angle, relative to the mat portion 43, corresponding with the angle formed by the intersection of the toeboard part with the horizontal floor part. The other edge or side of the connecting portion 45 merges into the mat portion 44 along a curve or on a radius as represented at 46. When the mat is arranged in place in the vehicle compartment, the mat portion 43 conforms to the horizontal floor part, and by deflecting or flattening out the curved portion 46, the mat portion 44 is made to lie flat against the inclined toeboard part in the position represented by the dotted line portion 47 in Fig. 3. Since the connecting part 45 is preformed to the desired angle relative to the mat portion 43, it will be seen that the mat portions 43 and 44 will assume positions flat against the

respective floor parts when the mat is arranged in the compartment.

With further reference to the floor mat illustrated in Figs. 1 to 6 inclusive, it should be understood that the fibrous backing layer 21 may be made to extend over the entire under surface of the wear sheet 20, but it is usually desirable to have the backing layer extend over the mat portions 43 and 44 which lie flat against the floor parts and to omit the backing layer from the preformed portions of the wear sheet.

In the event that vehicle controls project from or form a part of the floor irregularities, the preformed portions of the mat, such as the preformed portion 27 of the mat shown in Fig. 1, may be provided with appropriate control openings, for example, the openings 48 and 49 which, in this instance, accommodate respectively the gear shift lever and the emergency brake lever.

From the foregoing description and the accompanying drawings, it will now be readily seen that we have provided an improved form of vehicle floor mat and a novel method of making such mats. It will be seen, moreover, that since our improved floor mat is provided with preformed portions which overlie and conform substantially with floor irregularities, the mat will assume and always maintain the position which it is intended to have on the floor of the compartment, and, in addition to the wear resisting qualities of the fibrous wear sheet, the mat possesses the further advantages of presenting a neat and attractive appearance.

While we have illustrated and described our invention in a detailed manner, it should be understood, however, that we do not wish to be limited to the exact steps of procedure and details of construction which have been illustrated and described, but regard our invention as including such changes and modifications as do not involve a departure from the spirit of the invention and the scope of the appended claims.

Having thus described our invention, we claim:

1. A floor mat, for a vehicle compartment having a substantially horizontal floor surface and an inclined floor surface, comprising a flexible yieldable floor covering material having portions molded on spaced substantially parallel planes, and an angularly disposed section integrally connecting said portions, said section being preformed at an angle substantially the same as the inclined floor surface so that one of said portions can be adapted to conform to the inclined floor surface.

2. A floor mat, for a vehicle compartment having a substantially horizontal floor surface and an inclined floor surface, comprising a flexible yieldable floor covering material having portions molded on spaced substantially parallel planes and an angularly disposed section integrally connecting said portions, said section being preformed at substantially the angle of said inclined floor surface and having adjacent its connection with the corresponding portion a curve which is adapted to be flattened against said inclined floor surface when the mat is fitted into the vehicle compartment.

3. A floor mat, for a vehicle compartment having a substantially horizontal floor surface and an inclined floor surface and also having a floor hump projecting above the plane of the horizontal floor surface, comprising a flexible yieldable floor covering material having a portion thereof preformed to a bulge adapted to overlie and conform substantially to the floor hump

and also having generally flat portions molded on spaced substantially parallel planes which extend substantially in line with the top and bottom of the bulge, the portion extending in line 5 with the top of the bulge being adapted to conform to the inclined floor surface when the mat is fitted into said vehicle compartment.

4. A floor mat, for a vehicle compartment having a substantially horizontal floor surface and 10 an inclined floor surface and also having a floor hump projecting above the plane of the horizontal floor surface, comprising a flexible yieldable floor covering material having portions

molded on substantially parallel planes and a section integrally connecting said portions, one of said portions having a preformed bulge therein adapted to extend over and conform substantially to said floor hump and said parallel planes 5 being spaced apart a distance at least equal to the depth of the bulge, said section being preformed at an angle substantially the same as the inclined floor surface so that the other of said portions can be adapted to conform to the 10 inclined floor surface.

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