

Oct. 15, 1940.

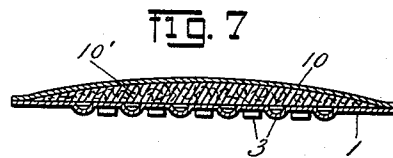
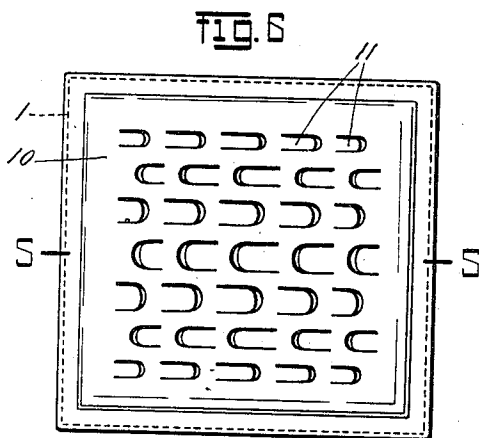
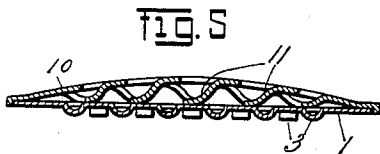
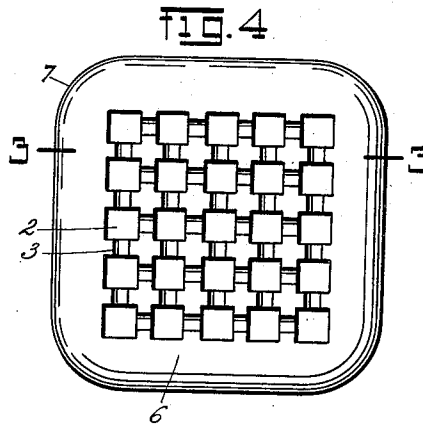
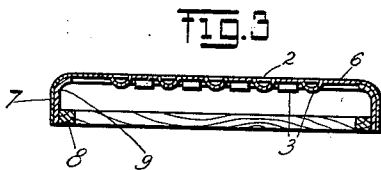
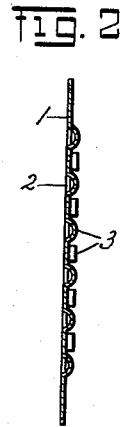
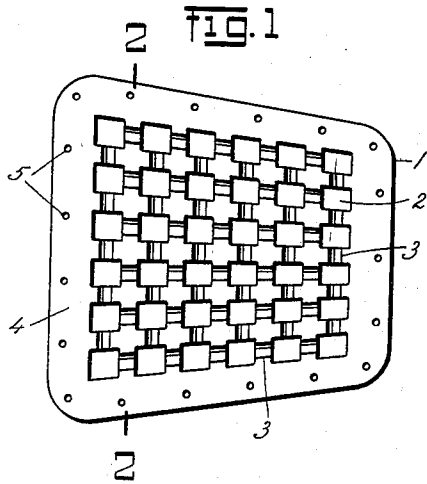
L. A. DUNAJEFF

2,217,893

FURNITURE SEAT

Filed Oct. 22, 1938

2 Sheets-Sheet 1



INVENTOR.
LEONID A. DUNAJEFF
BY *John P. Wilson*
ATTORNEY.

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L. A. DUNAJEFF

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FURNITURE SEAT

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2 Sheets-Sheet 2

FIG. 8

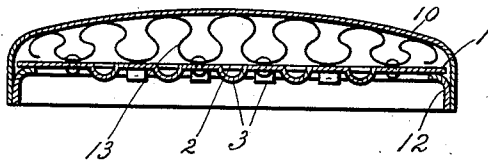


FIG. 12

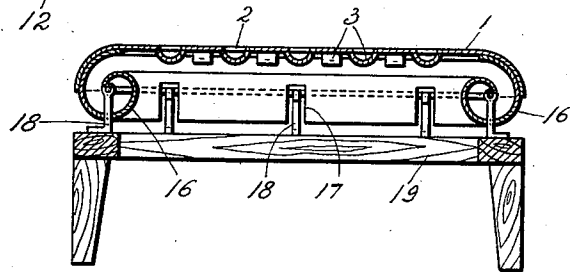


FIG. 9

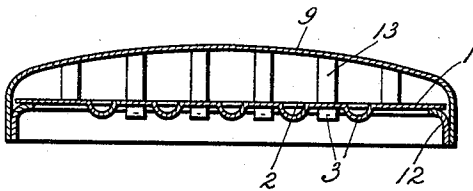


FIG. 13

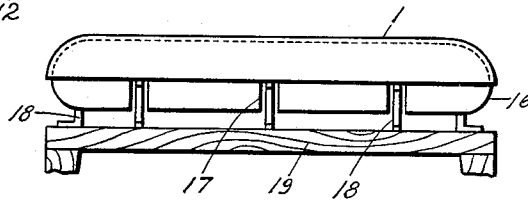


FIG. 10

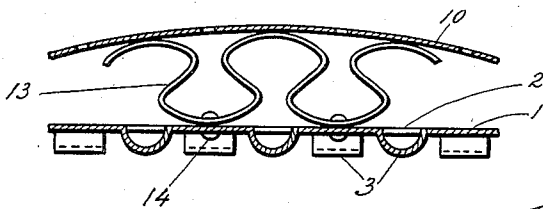


FIG. 14

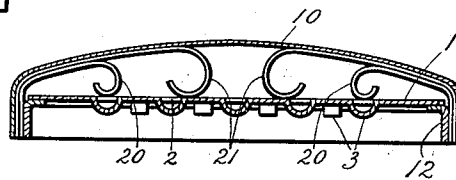


FIG. 11

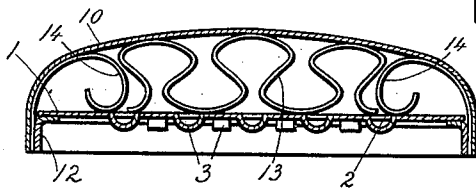
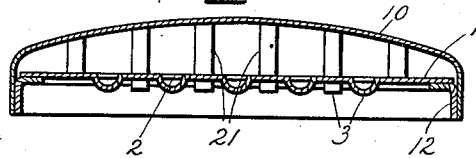


FIG. 15



INVENTOR.

LEONID A. DUNAJEFF

BY

John P. Hildebrand

ATTORNEY.

UNITED STATES PATENT OFFICE

2,217,893

FURNITURE SEAT

Leonid A. Dunajeff, New York, N. Y., assignor to
Commercial Ingredients Corporation, New York
N. Y., a corporation of New York

Application October 22, 1938, Serial No. 236,420

9 Claims. (Cl. 155—179)

My invention relates to furniture seats and has particular reference to resilient metal seats.

My invention has for its object to provide a seat made of a sheet material and rendered highly elastic and resilient by providing the sheet with resilient corrugations or folds. Sheets of such type have already been described in my copend-
5 patent applications Serial Nos. 142,630 filed May 14, 1937, which matured into Patent No. 2,158,929, May 16, 1939; 220,489 filed July 21, 1938, which
10 matured into Patent No. 2,192,573, March 5, 1940; and 220,490 filed July 21, 1938, the present application being continuation in part of said other applications.

My invention has for its object to provide a seat having its middle portion specially formed and/or corrugated according to the methods described in the foregoing applications, the outer marginal portions of the seat being solid and adapted to be
20 mounted on the framework of a particular piece of furniture such as seat or back of a chair, arm rest, or on a special reinforcing frame, or a portion of a seat of an automotive vehicle, etc.

Another object of my invention is to provide
25 my seat, back, or arm rest, etc., with perforations and corrugations arranged so that the resiliency of the sheet will be different at different portions of the seat in order to obtain the maximum of comfort in use. Thus a chair seat may be pro-
30 vided, for instance, with perforations gradually diminishing in size toward one end or toward the middle.

Another object of my invention is to provide
35 curved outer marginal portions so as to raise the middle portion of the seat thereby avoiding corners at the edges of the seat and rendering the seat more comfortable. The curved portions may be formed integrally with the main portion of the sheet and reinforced by a supplementary curved
40 frame on the inside of the marginal portion or they may be provided as a separately formed frame.

Another object of my invention is to provide a seat of the type specified above and having an
45 upper portion formed of a flexible or even pliable sheet curved to a convex shape, pressure transmitting elements being interposed between the two sheets, such as resilient packing in the form of metal wool, springs, or special corrugated strips
50 formed so as to have higher portions in the middle with relatively low or thin end portions. The convex sheet or cover may be made of an ordinary perforated metal, of a suitable metal mesh, or even of a non-metallic material such as leather,
55 cloth, etc.

Another object of my invention is to provide the upper sheet of a convex composite seat with resilient depressed portions extending deeper at the middle of the sheet and being relatively low at the ends, the depressed portions or tongues being, thereby, adapted to rest on the flat bottom
5 sheet.

Another object of my invention is to provide a reinforcing frame placed under the curved marginal portions of the main resilient sheet, the
10 frame being also curved, it may be also provided with curved loops resting on the bottom resilient sheet and, thereby spacing the top convex sheet from the bottom resilient sheet.

Still another object of my invention is to provide
15 the end portions of the seat with resilient spiral supports.

My invention is more fully described in the accompanying specification and drawings in which:

Fig. 1 is a top plan view of a resilient sheet
20 made in the form of a furniture seat.

Fig. 2 is an end view of the same.

Fig. 3 is a sectional view of a chair seat with curved reinforced marginal portions.

Fig. 4 is a top plan view of the same.

Fig. 5 is a sectional view of an all metal composite chair seat with a convex upper sheet.

Fig. 6 is a top plan view of the same.

Fig. 7 is a sectional view of a seat with a convex
25 top cover.

Fig. 8 is a sectional view of a seat having a convex top cover and resilient spacers.

Fig. 9 is another view of the same.

Fig. 10 is an enlarged detail view of the same.

Fig. 11 is a sectional view of a modified seat.
35

Figs. 12 and 13 are views of another modification.

Figs. 14 and 15 are views of a seat with the convex top supported on curved springs.

My seat comprises a sheet 1 preferably made
40 of an inherently resilient material such as steel, bronze, or similar metal or alloy, rendered resiliently flexible in its middle portion by one of the methods disclosed in the foregoing patent application. It may be, for instance, provided with
45 perforations 2 with corrugated bridges 3 between them. The sheet may be also heat treated to make it more elastic. For the purpose of making a comfortable seat, arm rest, etc., the perforations and corrugations may be made of progressively
50 varying sizes as shown so as to have the greatest resilient flexibility at certain selected portions of the seat. The corrugations may be preferably formed at the under side of the sheet so as to leave its upper surface relatively smooth. Solid 55

marginal portions 4 of the sheet are provided with additional holes 5 which may be used for attaching the sheet to the framework of a chair or similar furniture.

5 The solid marginal portions of the seat may be uniformly rounded off in order to make the seat more comfortable by avoiding sharp corners. Such an arrangement is shown in Fig. 3. The resilient sheet 6 has rounded marginal portions 7
10 which may be attached to a frame 8 forming part of a piece of furniture (not shown).

In order to prevent an excessive deformation of the curved marginal portions 7 in use, they may be reinforced underneath by a rounded frame 9
15 made of a relatively heavier material than the material of the sheet itself, which may be also corrugated. For this same purpose, the seat may be formed of several layers of my corrugated sheet.

20 Another modification is shown in Figs. 5 and 6. The upper sheet 10 is provided with integrally formed tongues 11 which are bent downward and curved as shown so as to provide resilient spacing supports for the top sheet. The tongues may be
25 made larger in the middle of the sheet and smaller at its marginal edges, thereby obtaining a convex shape when the sheet is placed on a flat resilient sheet 1.

30 Although my resilient sheet has the greatest resiliency when supported so as to present a flat surface, it may also be made of a convex or concave shape. It is often desirable, however, to have seats of a convex shape, with the central or other
35 portions more or less raised above the marginal portions. This purpose may be accomplished with my resilient sheet 1 by placing on top a supplementary sheet 10 as shown in Fig. 7, and filling the space between the flat sheet 1 and the convex sheet 10 with a suitable uphoistering material 10' such as hair, felt, etc. Steel wool or a
40 similar filling or stuffing material impervious to water may be also used if it is desired to make the seat of a sanitary type so that it can be sterilized by hot water or steam. The top covering sheet 10 may be in this case made of a thin flexible
45 sheet of metal, wire netting etc., or it may be made of my special corrugated sheet material.

Another modification is shown in Figs. 8 and 9. My resilient sheet 1 is mounted at its marginal
50 edges on the inner edges of a supporting rounded frame 12 and a plurality of resilient spacing strips 13 are placed on the sheet 1 at spaced intervals being attached by rivets 14 (Fig. 10) or by some other suitable means as, for instance, by
55 welding or brazing. The strips 13 are formed into mushroom-shaped corrugations as shown so as to form a resilient support for the top sheet 10 made of a flexible material or rendered flexible as by perforations. The corrugations of the strips 13 may be made of varying size as shown, the
60 middle corrugations being larger in order to provide for the convex shape of the covering sheet 10. The strips 13 near the ends of the seat may have all their corrugations of a small size so that the sheet 9 can be made convex in any
65 desired direction.

The reinforcing frame 12 may be extended deeper toward the middle of the seat as shown in Fig. 11, and the inner end portions 14' of resilient
70 strips may be curved inwardly and looped so as to form additional supports and spacers for holding the flexible top sheet 10 at a distance above the flexible sheet 1.

75 The marginal portions of the seat may be provided with additional resilient extensions as shown in Figs. 12 and 13. The sheet 1 is sup-

ported on a frame 16 having spirally curved portions 16 separated by slots 17. The spirals are supported on brackets 18 mounted on a frame 19 of a piece of furniture such as a chair, couch, etc. The top 10 of the seat may be supported on
5 the resilient sheet 1 by means of spirally curved springs 20 and 21 as shown in Figs. 14 and 15.

The composite structure of my seats, as well as the elementary resilient sheets, can be used for various parts such as seats, chair backs, cushioned
10 chair handles, couches, mattresses, etc., and also various other purposes such as resilient buffers, etc.

The materials used for parts of my chair seats may also vary, and base 1 can be made not only
15 of metal, but also of other suitable materials, including leather, etc.

It is understood that various other modifications can be made on the basis of the disclosure of this application, provided these modifications
20 come within the scope of the appended claims.

I claim as my invention:

1. A furniture seat consisting of a sheet of resilient material provided with resiliently expansive corrugations in the middle portion and
25 having a solid marginal portion adapted to be attached to the framework of a piece of furniture, the corrugations progressively varying from one end of the seat to the other so as to provide for different flexibility at its different portions.

2. A furniture seat consisting of a sheet of resilient material provided with resiliently expansive corrugations in the middle portion and having a solid marginal portion adapted to be
35 attached to the framework of a piece of furniture, a cover sheet made of a flexible material and attached at its marginal portions to the marginal portions of the resilient sheet, and a plurality of resilient strips bent into flexible corrugations filling the space between the two sheets.

3. A furniture seat consisting of a sheet of resilient material provided with resiliently expansive corrugations in the middle portion and having a solid marginal portion adapted to be
40 attached to the framework of a piece of furniture, a cover sheet made of a flexible material and attached at its marginal portions to the marginal portions of the resilient sheet, and a plurality of resilient strips bent into flexible corrugations filling the space between the two sheets, the middle
45 corrugations being higher than the outer corrugations so as to make the top sheet convex in shape.

4. A furniture seat consisting of a sheet of resilient material provided with resiliently expansive corrugations in the middle portion and having a solid marginal portion adapted to be attached to
55 the framework of a piece of furniture, a cover sheet made of a flexible material and attached at its marginal portions to the marginal portions of the resilient sheet, and a plurality of resilient strips bent into flexible corrugations filling the space between the two sheets, the middle corrugations of the middle strips being higher than the corrugations at the ends of the strips, the end
60 strips having relatively low middle corrugations, the top sheet being thereby imparted convex shape.

5. A furniture seat consisting of a sheet of resilient material provided with resiliently expansive corrugations in the middle portion and having a solid marginal portion adapted to be
70 attached to the framework of a piece of furniture, a cover sheet made of a flexible material and attached at its marginal portions to the marginal portions of the resilient sheet, and a plu-
75

rality of resilient strips bent into flexible corrugations filling the space between the two sheets, the corrugations being of a mushroom shape and adapted to resiliently collapse under load.

5 6. A furniture seat comprising a resilient sheet attached at its marginal portions to the frame-
 10 work of a piece of furniture, a convex cover sheet made of a flexible material attached at its marginal portions to the framework on top of the
 15 resilient sheet, and a plurality of strips made of a rigid resilient material supported at spaced intervals between the two sheets, the strips being curved into loops extending between the two sheets, the loops being of a larger size at the middle portions of the strips and of progressively reduced sizes toward the ends of the strips, the loops being thereby adapted to resiliently maintain the convex shape of the upper sheet.

20 7. A furniture seat comprising a resilient sheet rigidly supported at its marginal portions on the framework of a piece of furniture and adapted to resiliently yield at its middle portion under a load, a plurality of strips made of a rigid resilient material supported in parallel alignment on the
 25 resilient sheet, the strips being formed with a plurality of curved portions of a progressively increasing height toward the central portion of the sheet, the upper sides of the curved portions thereby forming a convex surface, and a flexible
 30 sheet extending over the curved portions and attached at its marginal portions to the frame.

8. A furniture seat comprising a resilient sheet rigidly supported at its marginal portions on the framework of a piece of furniture and adapted to resiliently yield at its middle portion under a load, a plurality of strips made of a rigid resilient material supported in parallel alignment on the
 5 resilient sheet, the strips being formed with a plurality of curved portions of a progressively increasing height toward the central portion of the sheet, the upper sides of the curved portions
 10 thereby forming a convex surface, and a flexible sheet extending over the curved portions and attached at its marginal portions to the frame, the curved portions being of a mushroom shape and adapted to resiliently collapse under load. 15

9. A furniture seat comprising a resilient sheet rigidly supported at its marginal portions on the framework of a piece of furniture and adapted to resiliently yield at its middle portion under a load, a plurality of rigid resilient strips supported
 20 in parallel alignment on the frame at their ends, the strips being formed with a plurality of corrugations resting at their lower sides on the sheet, the corrugations being higher at the central portion of the sheet than at its marginal portions,
 25 and a flexible sheet extending over the corrugations and attached at its marginal portions to the frame, the corrugations being of such a shape as to be resiliently collapsible under load applied to the flexible sheet. 30

LEONID A. DUNAJEFF.