Aug. 8, 1933. A. S. MITCHELL 1,921,691

CUSHION AND ITS MANUFACTURE

Filed June 6, 1932 5 Sheets-Sheet 1

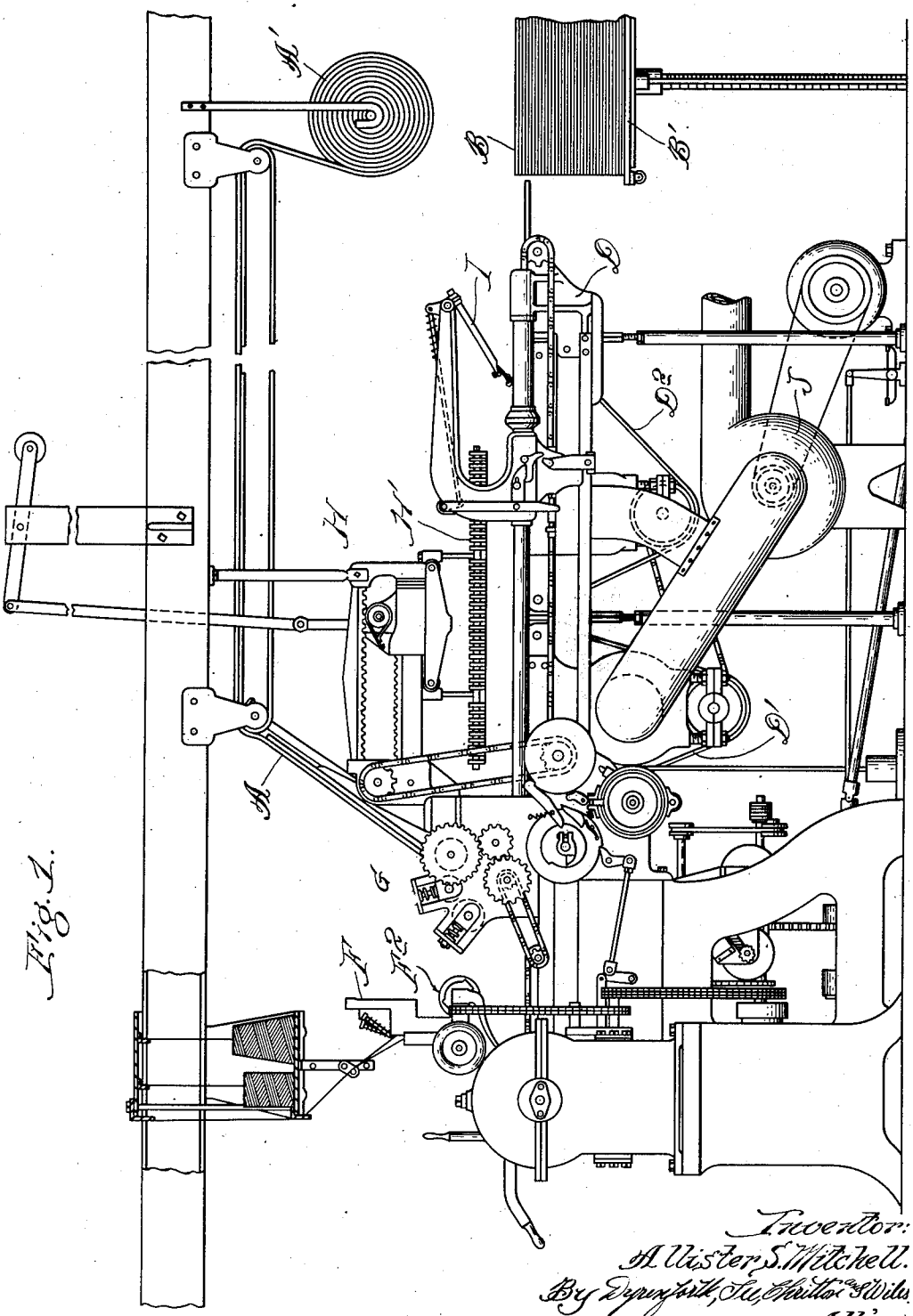

Fig. 1.

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CUSHION AND ITS MANUFACTURE

Filed June 6, 1932 5 Sheets-Sheet 2

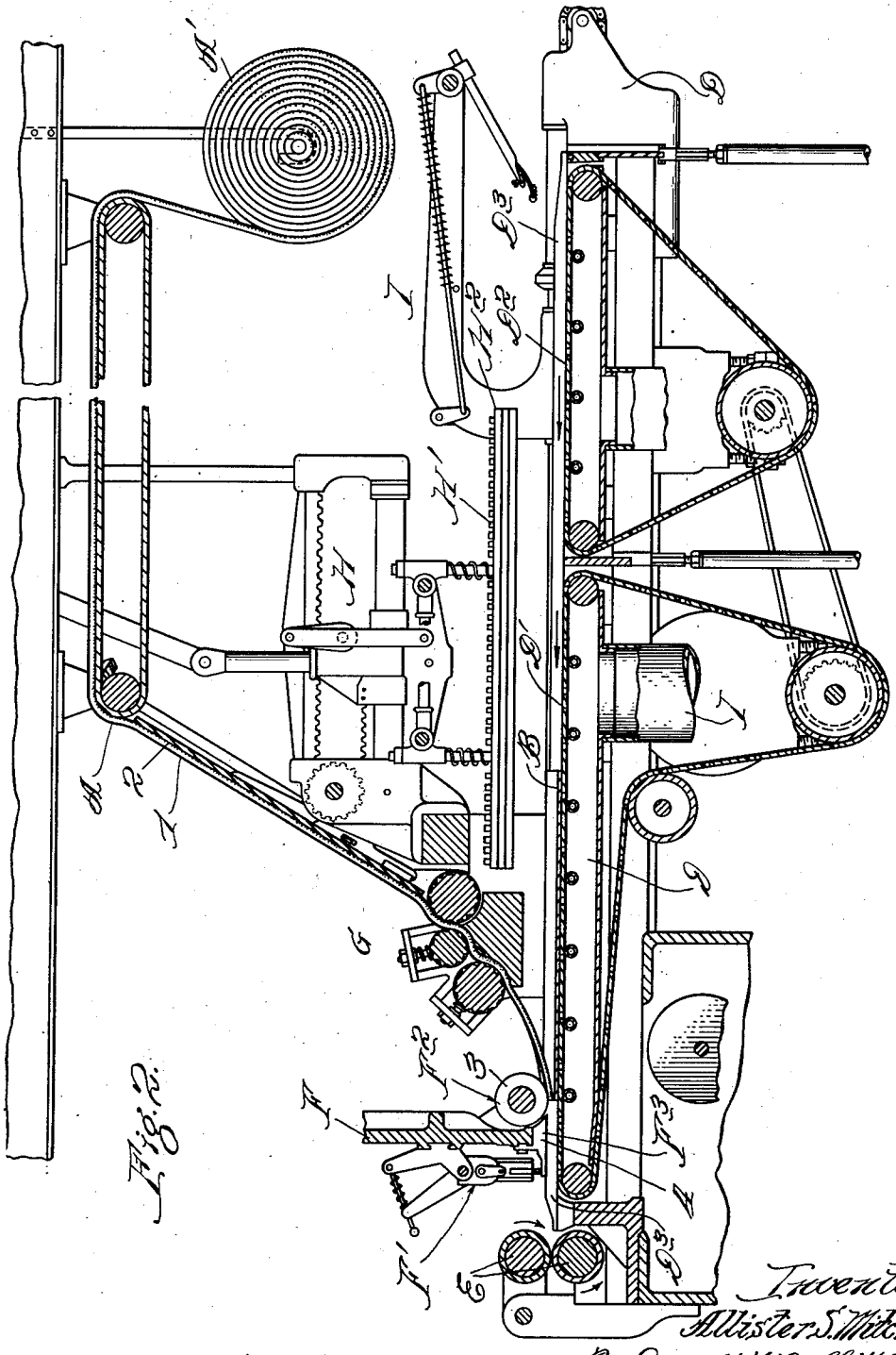

Fig. 2.

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Aug. 8, 1933. A. S. MITCHELL 1,921,691

CUSHION AND ITS MANUFACTURE

Filed June 6, 1932 5 Sheets-Sheet 3

Fig. 3.

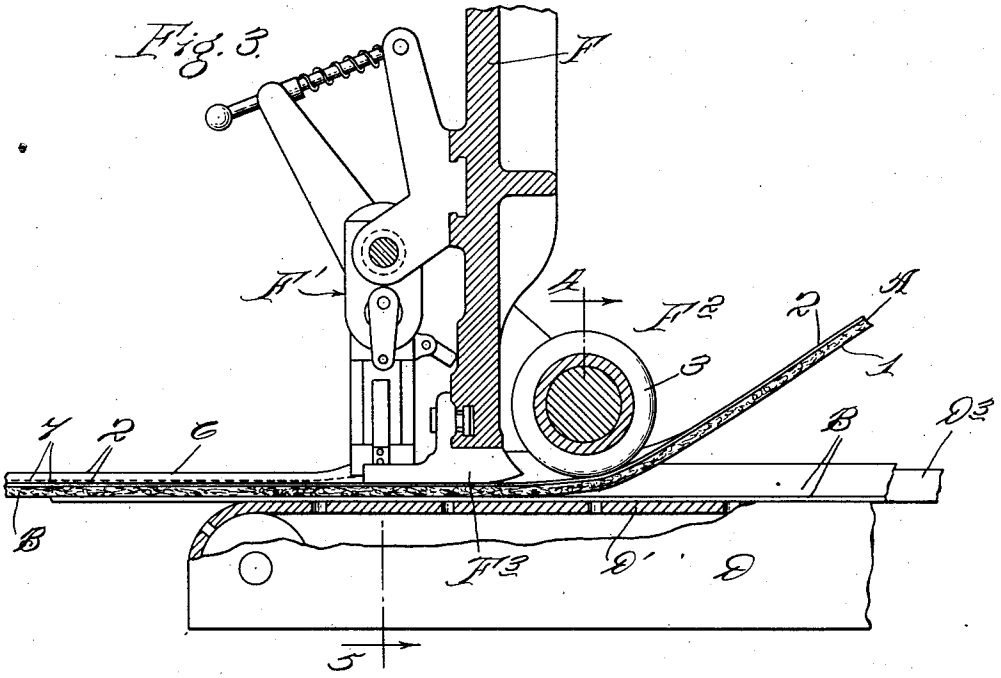
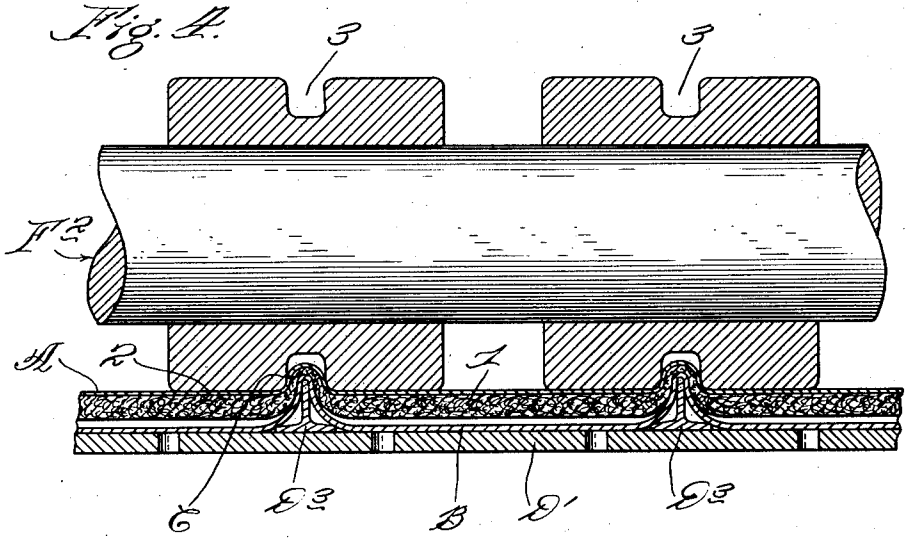


Fig. 4.



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CUSHION AND ITS MANUFACTURE

Filed June 6, 1932 5 Sheets-Sheet 4

Fig. 5.

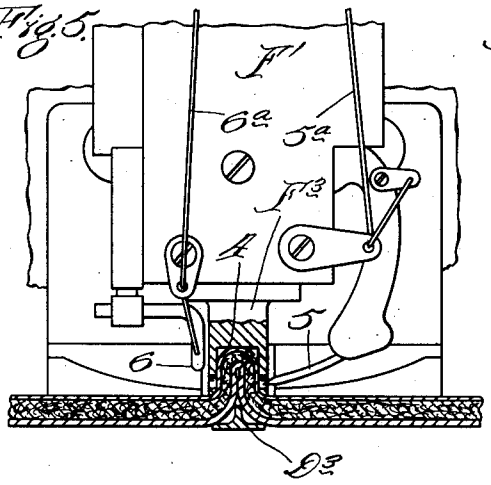


Fig. 4.

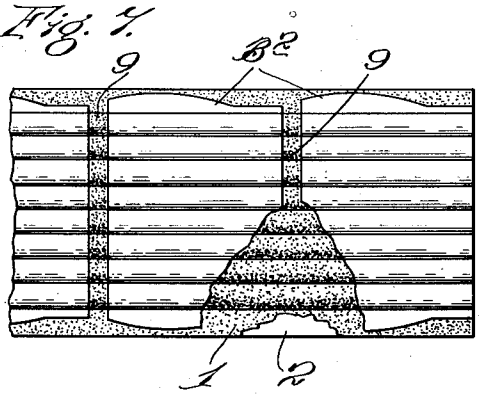


Fig. 6.

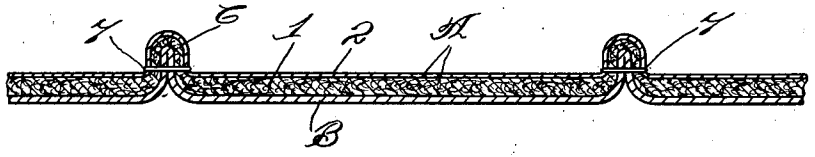


Fig. 8.

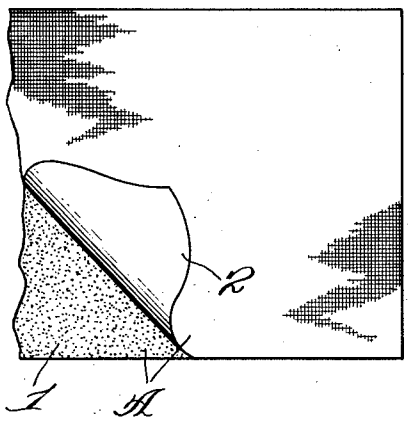
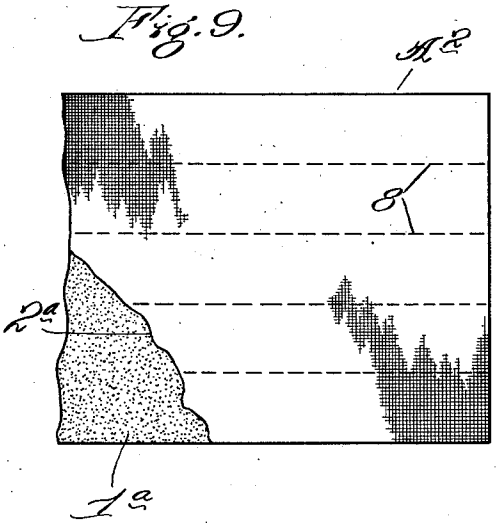


Fig. 9.



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CUSHION AND ITS MANUFACTURE

Filed June 6, 1932 5 Sheets-Sheet 5

Fig. 10.

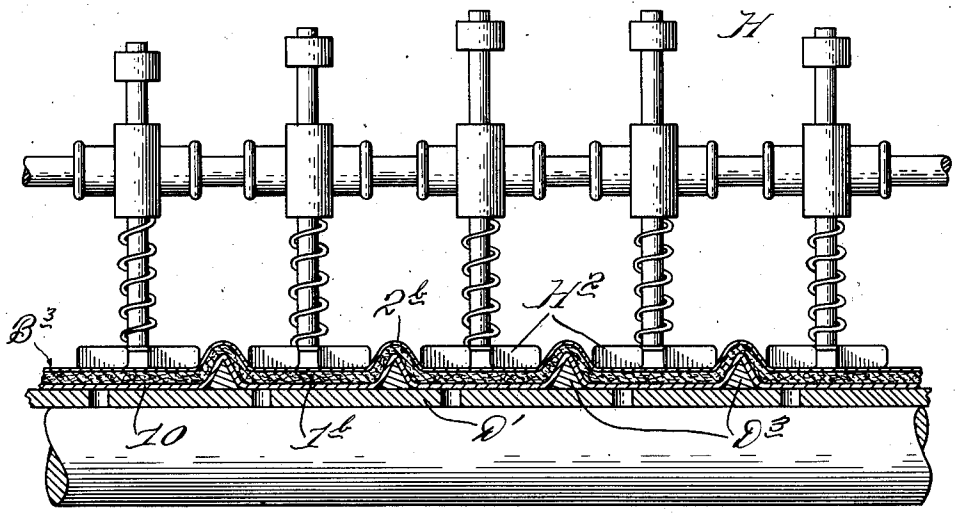
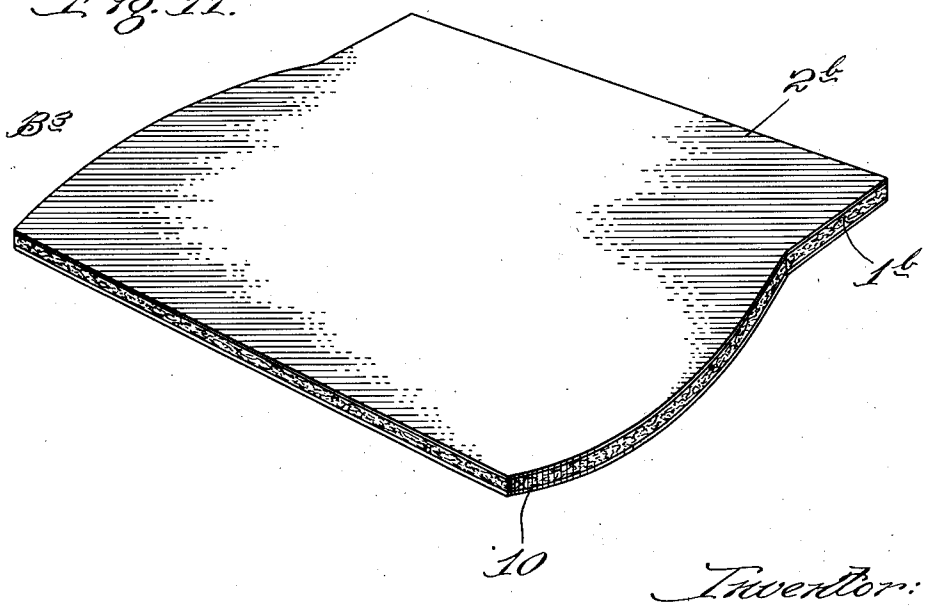


Fig. 11.



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Patented Aug. 8, 1933 1,921,691

UNITED STATES PATENT OFFICE

1,921,691

CUSHION AND ITS MANUFACTURE

Allister S. Mitchell, Detroit, Mich., assignor to National Automotive Fibres, Inc., Detroit, Mich., a Corporation of Delaware

Application June 6, 1932. Serial No. 615,652

12 Claims. (Cl. 112—262)

This invention relates particularly to cushions adapted to serve as inexpensive substitutes for stuffed, pleated cushions; also to the manufacture of such substitute cushions.

By the improved method herein described, it is possible to produce, at greatly reduced cost, a highly satisfactory substitute for the more expensive stuffed, pleated cushions which have heretofore been used generally for seat-cushions, and back-cushions in automobiles.

The improved cushion is particularly adapted for widespread use in medium and low-priced automobiles, but may be used for other purposes.

Otherwise viewed, the novel product herein described may be used as a substitute for flat (unpleated) cushions which are used to some extent in automobiles. The new product possesses the appearance of an ordinary pleated, stuffed cushion, and has the additional strength obtained from pleating the cushion. The new product is easy to apply to the seat-frame, or the back-frame, in an automobile, and may be used with perhaps as great, or even greater, economy than a flat cushion, which requires a heavy foundation pad (over the upholstery springs), and which requires a higher grade and more expensive quality of cloth. Moreover, it is more difficult to apply flat cushions properly and to give the desired uniform appearance. As has been indicated, the cost of producing the new cushion is very much less than the cost of producing the ordinary pleated, stuffed cushions.

In the improved process, as preferably practiced, a sheet of cotton batting, a lining of thin, stretchable fabric, and a cover, or finish-fabric, of desired quality are subjected to a forming operation, in which the three plies of material are provided with seam-ridges (at the lining side of the cushion); and the seam-ridges are subjected to a sewing operation, thus securing a pleated effect. In the operation of forming the seam-ridges, the cotton is compressed at the ridges sufficiently to insure the formation of a well-sewed seam.

The improved product preferably is produced by a method in which a continuous lining-sheet and a continuous cotton-batt sheet are fed through a suitable machine and seam-ridges produced therein. The cover-fabric may be fed through the machine as a continuous fabric (see Mitchell application, Ser. No. 427,205, filed February 10, 1930) or pre-cut covers may be fed through the machine (see Mitchell application 572,691, filed November 2, 1931).

Where a multiple-head sewing machine equipped with a suction-conveyor is employed, as in the above-mentioned applications, one may, if desired, employ pre-cut materials, wholly, in which the suction-conveyor is depended upon to feed the three-ply material, after the seam-ridges have been formed, to the sewing mechanisms of the machine.

The invention is illustrated, in its preferred practice, in the accompanying drawings, in which—

Figure 1 is a broken, elevational view of a multi-pleater machine adapted to the practice of the invention; Fig. 2, a broken longitudinal vertical section of the machine; Fig. 3, and enlarged fragmentary view of the suction-conveyor and one of the sewing-mechanisms mounted on a cross-head disposed above the front-portion of the conveyor; Fig. 4, a broken sectional view taken as indicated at line 4 of Fig. 3; Fig. 5, a broken transverse view taken as indicated at line 5 of Fig. 3; Fig. 6, a broken cross-sectional view of one of the improved cushions; Fig 7, a broken plan view illustrating the manner in which pre-cut covers may be spaced with relation to the continuous foundation, so that a connected series of cushions will be formed, which may afterwards be severed from each other; Fig. 8, a broken plan view showing a lining-fabric and a sheet of batting, preparatorily united by an adhesive; Fig. 9, a similar view showing a lining-fabric and a sheet of batting preparatorily united by a stitching, or tacking, operation; Fig. 10, a broken transverse sectional view showing the forming mechanism illustrated in Fig. 2, this view showing also a modification of the method, in which the lining-fabric, the batt-sheet, and the cover-fabric are pre-cut to cushion-form, and are simultaneously formed to provide seam-ridges; and Fig. 11, a perspective view of the pre-cut cushion blank just mentioned.

In the illustration given in Figs. 1–8, a continuous foundation, or pad, A, and pre-cut covers B are fed through the machine, and are suitably formed to provide suitably spaced, upstanding U-form seam-ridges, designated C; and these seam-ridges preferably are sewed by sewing mechanism employing sewing-needles which are thrust transversely through the seam-ridges and coact with looper-needles disposed at the opposite side of the seam-ridges. Sewing mechanisms adapted to the purposes are now well understood in the art.

The pad A preferably consists of a sheet 1 of fibrous filler, such as cotton-batting, and a lining-fabric 2, which may be a thin cotton-

fabric, or cotton-web. Cheese cloth, or tobacco cloth, may be employed, and usually is preferred, because of the facility with which it will stretch and assume the proper form, especially when the materials are fed through the machine in the manner illustrated in Fig. 2.

Detailed description of the machine illustrated is unnecessary to enable the improved method and improved product to be understood. Reference is made, however, to the above designated applications which fully illustrate and explain machines of this type.

Referring to the construction of the machine illustrated, D designates the bed of the machine, equipped with a front suction-conveyor D', rear suction-conveyor D^2, and longitudinally extending ridge-bars D^3 disposed above the conveyors and spaced apart to correspond with the distance between seam-ridges; E, a pair of feed-rolls between which the finished cushions are fed, after passing the sewing mechanisms; F, a cross-head having mounted thereon a series of sewing-mechanisms F' (one shown); F^2 a forming-roll having circumferential grooves 3 through which the ridge-bars extend; F^3, suitably spaced shoes carried by the lower portion of the cross head, these shoes having between them spaces or grooves 4 through which the seam-ridges pass; G, pad-strip feeding mechanism mounted on the bed of the machine; H, forming-mechanism disposed over the bed of the machine and coacting with the ridge-bars, said mechanism preferably comprising gravity pressure-rolls H' adapted to engage the lateral margins of the cover-fabric, and longitudinal former-bars H^2 which coact with the ridge-bars in the manner illustrated in Fig. 10; and I piece-placing mechanism adapted to feed pre-cut covers B from a stack of such covers mounted on a stand, or elevator, B'. The upper members of the suction-conveyors lie immediately beneath the longitudinal ridge-bars D^3. Means for creating a desired degree of suction within the conveyors is indicated at J. The upper lengths of the conveyors have a forward movement, as indicated by the arrows in Fig. 2.

The pad-sheet A is drawn from a suitable supply-roll A'.

It is to be understood that the various mechanisms of the machine are suitably geared together so as to operate in properly timed relation. In the operation of the machine, the pad-strip A which forms the foundation and the filling material for the cushions, is fed forwardly by the mechanism G, passed beneath the forming-roll F^2 and entered between the feed rolls E which exert a certain degree of forward pull upon the strip. The pre-cut covers are delivered by attendants to the rear portion of the bed and are quickly fed forward, seriatim, by the reciprocating, piece-placing mechanism I. After a cover has been fed forward to a position beneath the forming mechanism H, said mechanism operates in a manner described in application, Ser. No. 572,691 to depress the cover-fabric B into the spaces between the ridge-bars D^3, as will be understood by reference to Fig. 10. An intermediate former, or a pair of intermediate formers, descend first and crimp the cover medially; adjacent former-bars then effect crimping of adjacent intermediate portions of the cover, and so on. In this manner, the cover-fabric is pleated from its medial longitudinal portion laterally in both directions. It may be added that the movement of the forming mechanism H is such that the former-bars descend and move forwardly until the pleating operation has been completed, after which the former-bars are lifted and retracted, so as to be in readiness for the next operation. In the pleating operation, the cover is brought within the suction-grip of the conveyor and is carried forwardly beneath the forming-roll 3 and the cross-head which carries the sewing mechanisms. As the cover having the seam-ridges formed therein passes beneath the forming-roll, the pad-strip A is brought into proper relation with respect to the cover and the pad-strip has formed therein longitudinal seam-ridges, within which the seam-ridges of the cover become nested. The nested seam-ridges pass on through the circumferential grooves of the forming-roll F^2 and between the shoes F^3 carried by the cross-head, it being understood that the ridge-bars extend forwardly past the sewing mechanisms and through the grooves 4 of the seam-engaging foot of the sewing-head (see Fig. 5). The ridge-bars are suitably notched near their front ends to permit the sewing needle 5 to pass through the nested seam-ridges. The sewing-thread is carried through the seam-ridge and forms a lock or chain-stitch with a looper-thread, carried by a looper-needle 6.

In Fig. 5, 5^a designates the sewing-thread, and 6^a designates the looper-thread. In Fig. 6, the stitches are designated 7.

The filler-pad A may be of any desired thickness, within reasonable limits. In the forming-operation, the seam-portions of the cushion are preferably compressed. The operation described above naturally stretches the cotton-batting 1 and lining-fabric 2 in forming the seam-ridges; also, the cotton is somewhat thinned at the seams. Nevertheless, a more or less resilient seam is formed, which is of some advantage in "hanging" the cushion on the seat-frame, or back-frame, as the case may be. Moreover, the rather thick, resilient seams provided by this method tend to accentuate the pleating effect, and to preserve the cushion from tearing, in use.

In Fig. 9, A^2 designates a pad-strip, in which the cotton-batting 1^a and the lining-fabric 2^a are connected by longitudinal tackings, or stitch-rows, 8. In practice, the cushion ordinarily is placed over a cotton pad, or the like, which overlies the upholstery springs in the seat. It may be possible, in a less desirable embodiment of the invention, to omit the lining fabric. In any event, any suitable pad-strip, or filler-strip, of resilient filling material may be employed as a foundation for the cushion.

While it is preferred to unite the lining-strip and the strip of cotton-batting and feed them through the machine together in the manner shown in Fig. 2, nevertheless, it is possible to feed these strips separately and bring them together beneath the forming-roll 3.

Fig. 7 shows a series of cushions B^2 formed upon a continuous batt-strip consisting of cotton-batting 1, and lining-fabric 2. The spaces between the cushions are designated 9. A suitable cutter may be employed to sever the cushions from each other at the spaces 9.

In the modification of the process illustrated in Figs. 10 and 11, B^3 designates a pre-cut cushion which comprises cotton-batting 1^b, a lining-fabric 2^b and a cover-fabric 10. These plies may be properly assembled and then cut to form in a single operation. They may then be fed

forward over the bed of the machine and subjected, as a unit, to a forming operation, in the manner illustrated in Fig. 10. The suction-conveyor may then operate to carry the formed cushion beneath the forming-roll and to the sewing mechanisms, where the seam-ridges may be sewed in the manner illustrated in Fig. 5.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I regard as new and desire to secure by Letters Patent, is:

1. A method of manufacturing cushions simulating pleated, stuffed cushions, which comprises forming in a cover-fabric and a pad-strip which comprises unwoven resilient sheet padding material nested seam-ridges, and sewing said nested seam-ridges together.

2. A method of forming a cushion simulating a pleated, stuffed cushion, which comprises forming a cover-fabric and a pad which comprises unwoven resilient sheet padding material to provide nested seam-ridges, the material of the pad being compressed at said ridges, and sewing the seam-ridges.

3. A method of forming a cushion which comprises forming a pad of resilient filling material in unwoven sheet form and a cover-fabric to provide upstanding nested seam-ridges at the pad-side of the cushion, and sewing said seam-ridges.

4. A method of manufacturing cushions which comprises: forming seam-ridges in a cover-fabric while feeding said cover-fabric forwardly; forming seam-ridges in a continuous pad-strip which comprises unwoven resilient material in sheet form and nesting the seam-ridges of the cover-fabric within the said second-mentioned seam-ridges, and sewing the seam-ridges by transverse stitches.

5. A method of forming a connected series of cushions with spaces between cushions which comprises: feeding a pad-strip which comprises unwoven resilient material in sheet form and forming therein longitudinal seam-ridges; separately feeding pre-cut covers and forming therein seam-ridges and bringing said second-mentioned seam-ridges within the embrace of said first-mentioned seam-ridges; and sewing the nested seam-ridges.

6. A method of forming cushions, which comprises: feeding a continuous pad-strip comprising a lining-fabric and a layer of resilient material associated therewith and forming upstanding seam-ridges therein; feeding, seriatim, a series of pre-cut covers and forming upstanding seam-ridges therein, and bringing the same into nested relation within said first-mentioned seam-ridges; and sewing the nested seam-ridges.

7. A method of forming a cushion which comprises: pre-cutting a cover-fabric and superimposing the pre-cut cover on a pad which comprises unwoven resilient material in sheet form; forming seam-ridges and intervening pleats in said materials as a unit; and sewing the seam-ridges.

8. A cushion comprising a cover-fabric and a pad of resilient material having nested seam-ridges, said pad comprising a sheet of unwoven resilient padding material, and stitchings connecting said seam-ridges.

9. A cushion comprising a cover-fabric and a pad of resilient material having nested seam-ridges, and stitchings connecting said seam-ridges, said pad comprising a loose sheet of resilient cushioning material and said stitchings comprising threads extending transversely through the seam-ridges.

10. A cushion comprising a lining-fabric provided with seam-ridges, a pad comprising an unwoven sheet of resilient material provided with seam-ridges nested in said first-mentioned seam-ridges, and a cover-fabric having seam-ridges nested within the second-mentioned seam-ridges, and stitchings uniting said seam-ridges at each seam.

11. A method of making cushions which comprises: ridging a continuous sheet of unwoven resilient padding material and a series of pre-cut covers and forming seam-ridges and intervening pleats and nesting the seam-ridges; sewing said seam-ridges; and severing said sheet between the covers.

12. A method of making cushions which comprises: forming in a continuous padding sheet of unwoven resilient material and a continuous cover-fabric nested seam-ridges; sewing said seam-ridges; and cutting the assembly into sections to provide separate cushions.

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