

May 30, 1933.

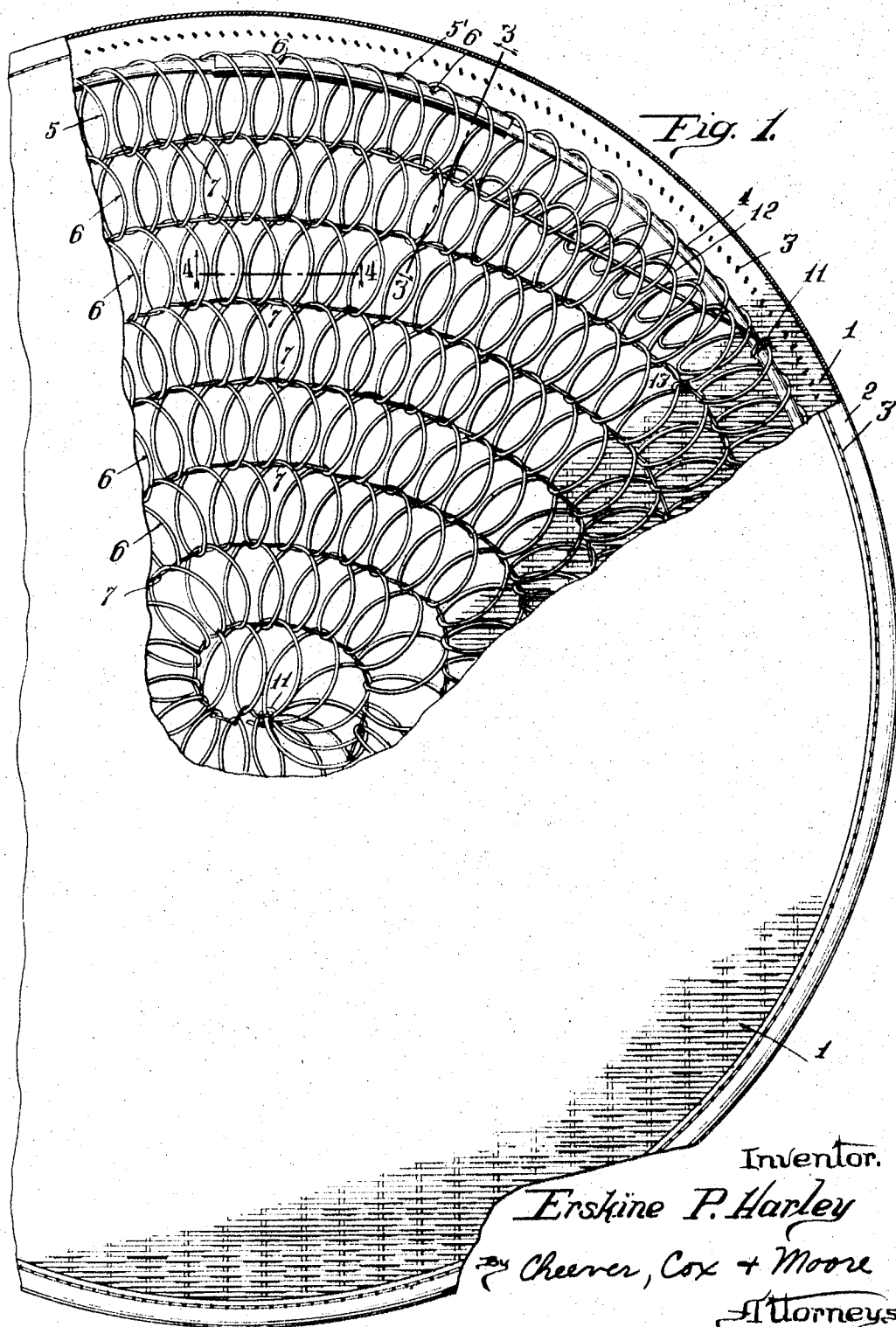
E. P. HARLEY

1,911,276

VENTILATED CUSHION

Filed April 13, 1931

2 Sheets-Sheet 1



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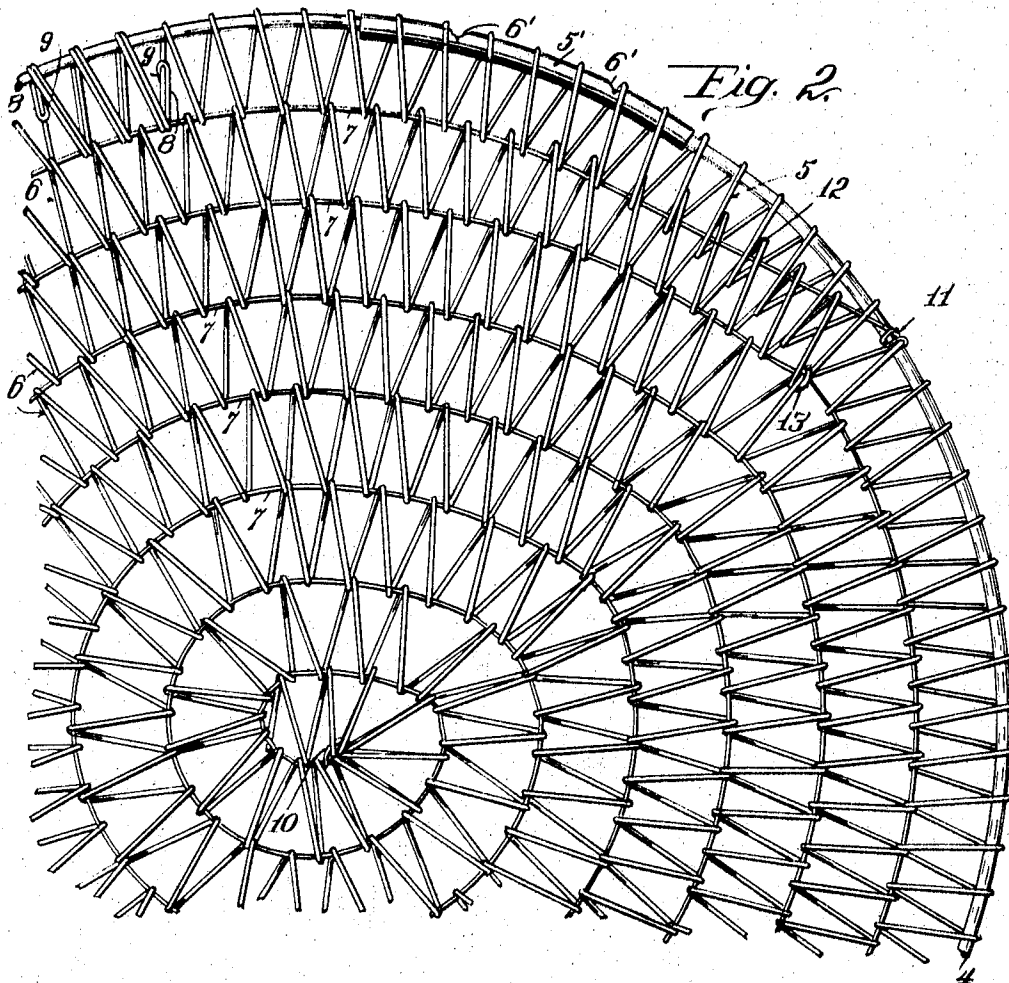
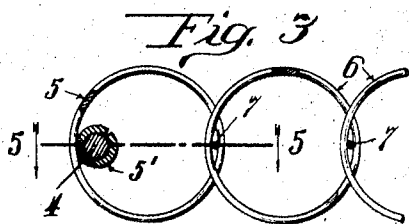
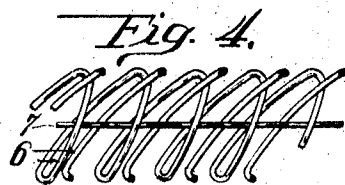
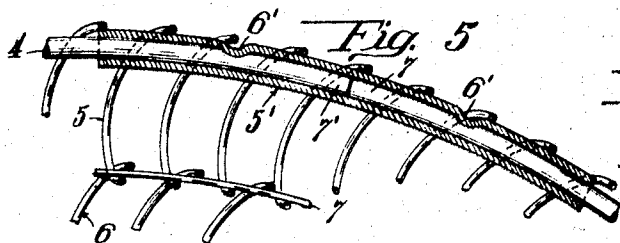
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UNITED STATES PATENT OFFICE

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VENTILATED CUSHION

Application filed April 13, 1931. Serial No. 529,908.

The present invention relates to cushions and particularly to a ventilated cushion which not only is comfortable to sit upon but which is also ventilated so as to permit the heat from one's body to be conveyed away and thereby make the cushion more comfortable to sit upon.

My present invention relates particularly to the inner construction of the cushion which is very simple and effective.

One object of this invention is to provide a simplified construction for cushions which is very effective for the purposes intended.

Another object of this invention resides in using a coiled spring wound in spiral form to form a substantially flat cushion of considerable area which is relatively thin and yet quite resilient so as to make the device comfortable to the user thereof.

Other objects of this invention will appear hereinafter, the novel features, arrangements and combinations being clearly set forth in the accompanying claims.

In the drawings:

Fig. 1 represents an elevation of a cushion embodying my invention, parts thereof being broken away for the sake of clearness;

Fig. 2 is a view showing the construction of the coiled spring which forms the inner part of the cushion just before the final step of making the same;

Fig. 3 is a section taken along the line 3—3 of Fig. 1;

Fig. 4 is a section taken along the line 4—4 of Fig. 1; and

Fig. 5 is a section taken along the line 5—5 of Fig. 3.

The present construction is adapted particularly for cushions to be used on the seats of automobiles and the like. As previously pointed out, it is desired that the cushion be well ventilated and at the same time constructed in such a manner as to make the same comfortable to the driver. Another novel feature resides in the simplified construction of the cushion as it is very desirable to produce a relatively inexpensive cushion so that the demand therefor will be increased. Motorists are not inclined to pay a very considerable amount for any cushion of this na-

ture and at the same time they demand a comfortable cushion. With the present invention the construction is relatively simple and yet is quite rugged and can be produced at a relatively small cost as compared with some of the known constructions of cushions.

The outer portion of the cushion is formed by two layers of relatively loosely woven fabric indicated by the reference numeral 1. In the embodiment shown these always are of circular form and are bound together at their edges by the leather binding strip 2 having the stitching 3 which firmly holds the leather binding strip in place.

Within the cover there is a circular substantially rigid outer frame 4 formed of a piece of heavy wire secured together at its ends by a coupling member 5' which is indented at 6' in any suitable manner so as to hold the opposite ends 7' of the wire in fixed relation with each other. It is obvious, of course, that other means may be used for holding the ends of the wire together, and if desired, the part 5' may be dispensed with and the ends 7' welded or otherwise permanently secured together. However, the construction shown in Fig. 5 is one which enables me to reduce the cost of manufacture and render it relatively simple for an inexperienced operator to construct the same.

The resilient portion of the cushion is supported by its outer frame 4 and comprises principally three elements—an outer coiled member 5, an inner coiled member 6 and a piece of wire 7 which is used to hold the turns of the coils in proper relation with each other.

The outer coil 5 is a plain coil of uniform diameter which embraces the frame 4, as is clearly illustrated in Figs. 1 and 2. The meeting ends of the coil 5, seen in Fig. 2 at the upper left thereof, are indicated by the reference numerals 8, these ends being intertwined with each other so that portions thereof and of the adjacent turns of the coil lie in parallelism, as is clearly illustrated in this figure. I then bend the ends 8 of each coil about the adjacent turns of the coil so as to make a substantially endless coil embracing the outer frame member 4. With

this arrangement the outer peripheral edge of the spring construction is uniform so that when the cover is placed thereover, the edge of the cushion will present a uniform appearance.

The coil designated generally as 6 is also a coil of uniform diameter and this coil is wound in a substantially spiral form about itself, beginning at the center of the frame 7. The wire 7 has one end 10 thereof (see Fig. 2) embracing several of the coils at the center so as to hold them together to form a nucleus for the remaining portion of the spiral into which the coil spring is to be formed. The spring is then wound in a spiral form and as the winding proceeds, the wire 7 is threaded through adjacent turns of the coil in one layer of the spiral and the turns of the coils in the next succeeding layer thereof. This arrangement is quite clearly illustrated in Figs. 3 and 4. With this arrangement the various turns of the spiral cannot move away from each other although they are permitted to move toward each other and have the turns of adjacent layers of the spiral overlap more than is shown in the drawings.

The spiral is continued until it is just slightly larger than the area defined by the inner portions of the coil 5 and the wire 7 is passed through the overlapping portions of the outer turns of the spiral and the turns of the coil 5. The other end of the wire 7 is thereafter wrapped about the outer framework as at 11 to thereby move all of the turns of the spiral in an outward direction and hold them extended in the form shown to prevent their moving in towards the center of the spiral. As will be noted at 12 in Fig. 1 and Fig. 2, the last few turns of the inner coil 6 overlap considerably the turns of the outer coil 5. It is because of the fact that it is relatively hard to form a smooth outer edge by using a spirally wound coil that I prefer to use the outer coil 5 in conjunction with the inner spiral. However, I wish to have it understood the outer coil is not an absolute necessity but does have desirable features which are not possessed by a true spirally wound, coiled member. The outer end of the coil 6, indicated at 13, is looped about an adjacent turn of the previous coil so as to prevent the unraveling of the coil.

After the coils have been interlaced as illustrated in Fig. 2 the same are placed between two presses which may be hydraulic presses or any other known type of presses, and these presses are brought towards each other against opposite sides of the device illustrated in Fig. 2. As the presses are brought toward each other, they are rotated in opposite directions relative to each other, or at least one of the presses is rotated so that there is a relative rotation of the presses, the

primary action of the press being to flatten the coils toward one side so that the coils will yield in that direction, while the secondary purpose is to cause a circular relative movement between the presses so that the coils will all be flattened in one direction. Furthermore, if the presses were brought against the coils without any rotating movement, the result would be that when the cushion was in use the turns of the coil would become flattened, i. e., they would tend to form ellipses, which, of course, is not desired. After the presses have operated the turns of the coils assume the positions indicated therefor in Fig. 1. Hence, when the user sits on the cushion the coils all flatten or overlap each other and form a resilient cushion which will quickly resume its natural shape due to the resistance which the wire has to torsional forces. In other words, when the coils are flattened into overlapping relation, the wire is twisted in a direction transverse to its length and the tensile resistance of the wire is sufficient to cause the same to resume its normal shape when the cushion is not in use. In other words, I preferably use a wire which is relatively strong in its resistance against torsional forces.

As already stated, the cover is formed of a relatively loosely woven material having a sort of basket weave to it. The particular weave is not important to this invention, except that it should be such that air will readily circulate therethrough.

One advantage of my invention is that I may form a continuous coil of wire which forms the essential part of my invention, and cut the same into the lengths necessary for making the completed cushion and using only two other elements, viz: the outer frame and the wire 7 which hold the turns of the coils in proper relation to each other. The binding strip 2 prevents the edges of the cover from unraveling and forms a complete closure for the spring portion of the cushion. Due to the numerous coils of the spring, each coil is not subjected to any great amount of stress when the cushion is sat upon and accordingly the life of the cushion is practically indefinite.

This ventilated cushion has a number of desirable features which make the same more useful than other devices designed for motorists for like purposes. Where merely the loosely woven fabric covering is used upon the seat of an automobile there is not sufficient ventilation due to the closeness with which the cover is pressed against the seat in the automobile, the seat of the automobile generally being covered with a fabric which will not permit the passage of air there-through to any considerable extent.

With rubber inflated cushions designed primarily for ease in riding there is no means for ventilation provided, and consequently

this type of cushion is undesirable. With my device, however, the cushion is not only resilient to conform, more or less, to the shape of the individual and thereby make long drives less tiresome, but it also provides a considerable amount of air space from which the air can readily escape, and be replenished from time to time to cause a complete recirculation of air through the cushion while it is being used.

Other modifications of my invention will occur to those skilled in the art to which this invention pertains and therefore I do not wish to be limited in my invention except as set forth in the appended claims.

Having thus fully described my invention, what I claim and desire to obtain by Letters Patent is:

1. The method of manufacturing cushions comprising the steps of forming a coil of substantially uniform diameter from a spring wire, forming the coil into substantially spiral form with the turns of the coil arranged in planes substantially normal to the axis of the spiral, providing means for holding said coils in spiral formation and twisting all of the turns of the coil simultaneously so that they are arranged in planes which are other than normal to the axis of said spiral.

2. The process of making a resilient cushion comprising the steps of forming a coiled spring of substantially uniform diameter, winding the coiled spring into a spiral form providing means for holding said coils in spiral formation and bringing presses to bear against opposite sides of said coiled spring, and moving said presses relatively to each other in a circular direction which is substantially parallel with the plane of the spiral to thereby flatten adjacent turns of the coils in the same direction as the presses are brought toward each other.

3. The method of forming a cushion from spring wire which comprises the steps of forming a coil of substantially uniform cross-section with the turns of the coil substantially parallel with each other and the axes of each single turn of the coil substantially parallel with and concentric to the axis of the coil, winding the coil into spiral formation, providing means for holding said coils in spiral formation, and thereafter simultaneously twisting the individual turns of the coil out of their first position so that their axes are at an appreciable angle with the axis of the spiral and eccentric with respect to the axes of the other individual turns of the coil.

In witness whereof, I have hereunto subscribed my name.

ERSKINE P. HARLEY.