

April 17, 1934.

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1,955,583

INNER SPRING MATTRESS AND THE LIKE

Filed Aug. 26, 1932

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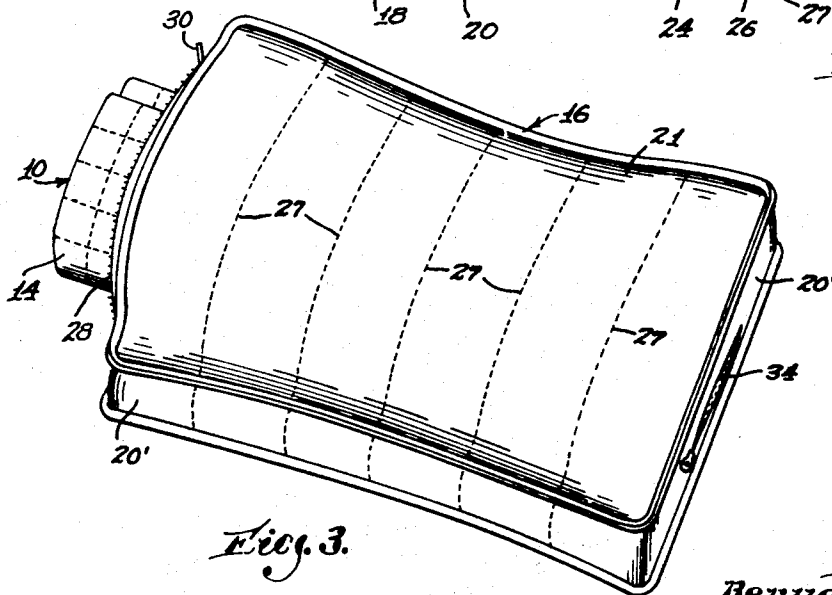
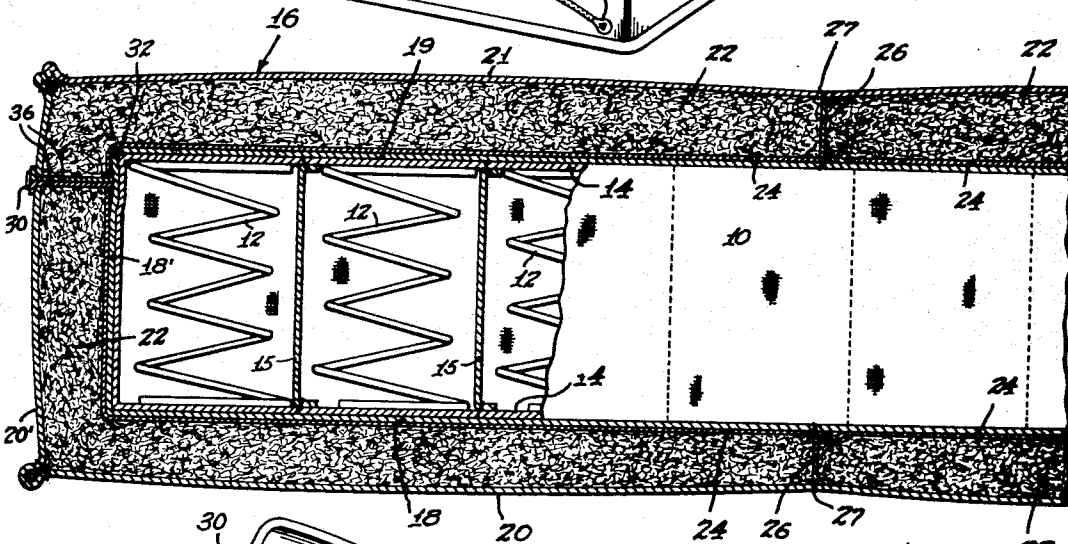
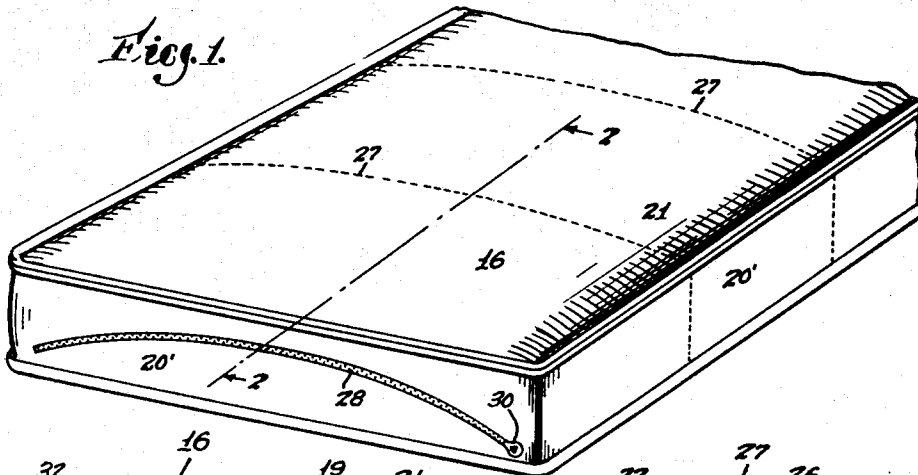


Fig. 3.

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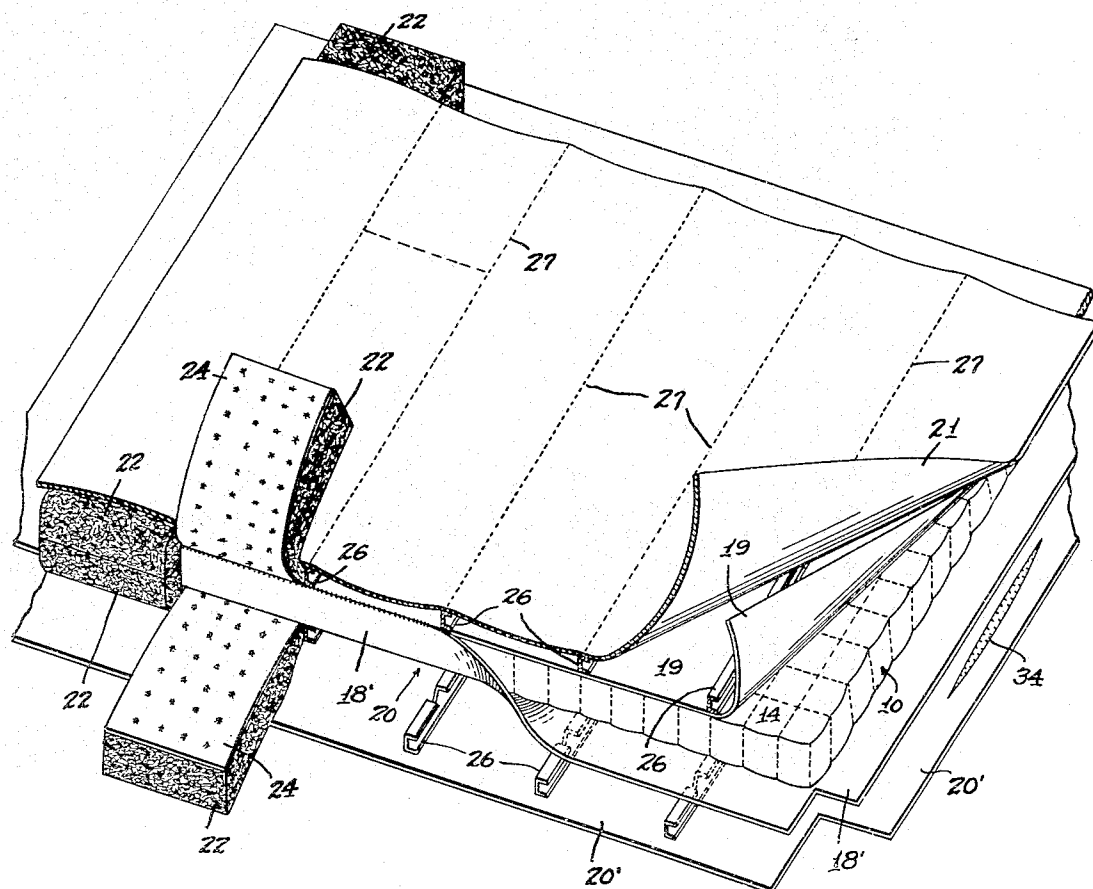


Fig. 4.

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UNITED STATES PATENT OFFICE

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INNER SPRING MATTRESS AND THE LIKE

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4 Claims. (Cl. 5—351)

This invention relates to improvements in inner spring mattresses and the like.

More particularly it provides an inner-spring mattress whose spring portion, extending the entire length and breadth of the mattress as a single unit, is easily removable, and replaceable for repair. It provides also an improved pad-and-casing structure, extending as a single enveloping unit on both sides of, and around the edges of, the spring unit by a combination of partitions, block pads, mouths and closures, such that the mattress as a whole is durable, in the sense that twine does not break nor hair become displaced, and comfortable in that it has a continuous satisfyingly smooth surface, and is economical and convenient to manufacture, in that special skill in the art of stuffing hair, etc., is not requisite.

The comparatively recent development of the inner spring type of mattress has made great progress in driving earlier types from the market, but has been attended by problems arising from abrasion of the metal springs on the tufting-twine, whose function is to hold the hair in place, being strings which pass through the spring region; and from abrasion of the individual springs on the fabric which immediately encloses them. This fabric is usually burlap, a material which is naturally subject to failure after two to ten or more years of service, by disintegration of its jute.

When any burlap gives way more or less tipping of individual springs results.

When any tufting gives way, sometimes after two to six months of use, the hair may begin to shift into bunches or mounds, leaving sparse or vacated areas. In mattresses as ordinarily made heretofore, the resetting of a tipped spring coil involves a removal of the spring unit; for which there has to be a cutting of all tufting twine; and then, after a righting of the offending springs, a restuffing of the hair, and a retufting of the whole. For the latter, as well as for the original construction of the mattress there is needed a worker of experienced dexterity in the packing of the hair.

The invention provides a combination of an enveloping cushion casing made of blocks of hair or other padding in an ensemble which is self-held against expansion and against shift of hair, without tufting; with a spring structure which is self-held against expansion, without penetration by tie-strings, but with such a flexibility, while within the casing, that it can be manipulated so as to be folded, collapsed, and removed through a relatively small mouth in one end of the enveloping pad.

A feature resides in the external pre-assembling of the pad material in the form of a section of the envelope wall, although thicker so as to be compressed when inserted. This, when fitted between the customary stout outer ticking, a stout inner ticking made to fit the exterior of the spring unit, and stout sheet partition ties extending at intervals between these two spring-enveloping tickings, makes a structure in which the hair was placed and distributed by ordinary skill and subject to visual test and examination, and is maintained in proper arrangement without ties passing through the spring section.

In the completed mattress the spring unit is wholly unattached to but is completely encased within the hair; and the compressed blocks of hair hold enclosing walls thereof sufficiently rigid; which in turn, by reason of the sheet tie-partitions holding the walls against spreading, maintain the hair against creeping and bunching.

The spring unit may be withdrawn through a suitable mouth at one end of its cushion pad walls; and a smaller mouth, a sort of hand hole, at the end opposite the main slit, permits a person to reach in for manipulating the spring unit for removal.

Another feature relates to the double walled ticking envelope, whose interior space, between its two walls, has partitions; and the discovery of a method by which such a structure can be made, and the pads be enclosed thereby, in the walls thereof, with seams of the envelope structure presenting exteriorly a furnished aspect, and with the interior wall of the envelope supported wholly by the exterior wall thereof, and presenting a smooth and sufficiently stiff slip surface between the pad sections and the spring unit.

The invention thus makes spring failures readily accessible, without disturbing the disposition of hair in the mattress. Thus a spring repair job, which heretofore has required a person expert in the art of mattress stuffing, can be made by a person of ordinary training; and this enables a home, or a hotel, to repair its own mattresses. The external block system of hair disposition moreover permits an exact and even distribution of hair, and the stitching to effect a roll edge, to be made without aid of an expert in the art of stuffing.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawings:

Figure 1 is a perspective view of an inner-spring

mattress embodying features of the invention;

Figure 2 is a section on 2—2 of Figure 1, somewhat enlarged;

Figure 3 is a perspective view, representing the spring unit partially out of its casing; and

Figure 4 is a perspective which shows various stages in the construction and filling of the double-walled envelope.

Referring to the drawings, my improved mattress comprises an inner-spring unit 10 of any suitable self-contained style extending through the entire length and breadth of the mattress, that illustrated as an example being four inches thick and having its individual spring coils 12 enclosed within a suitable fabric cover 14, usually burlap, having fabric partitions 15 dividing the whole into a multiplicity of cells, one for each of the coil spring elements 12. Any standard or suitable type of inner-spring unit may be used.

Each face, side and end of the spring unit is confined by an enveloping pad or cushion which is a combination structure consisting of a pair of strong fabric walls and their filling. The walls of the pair are held an inch or so apart by their intervening padding of compressed blocks of hair or other fibre. The whole constitutes a casing for the spring unit, making the total thickness constitute a six-inch mattress. That is, instead of the hair resting directly on the spring unit, I employ two housings of ticking, of which the inner one 18, 18', 19, rests next to the fabric cover 14 of the spring unit; and the outer one 20, 20', 21 corresponds to the exterior ticking of an ordinary mattress. And instead of the hair 22 being massed in continuity, it is in blocks set in compartments separated by short interior tie-partitions 26 of ticking, which prevent any pair of the main tickings as 19 and 21 from being spread apart more than the predetermined one inch. Each compartment within the double enveloping wall, thus made, is small enough to prevent compressed hair within that compartment from becoming displaced appreciably.

The said filling is blocks of pad material, as hair, sisal, kapok or other fibrous elastic substance, which may be prepared in advance by uniform distribution over an area and shape equal to that of the compartments which they respectively are to fill; and they are preferably cohering blocks. For example, the filling material may be spread out in sheet form on a thin muslin base or backing 24, in a mass uniformly thick. It may preferably be thus laid out and secured by stitching, or in the case of hair by looping on a large muslin sheet (not shown), the mass and sheet then being sheared into blocks of desired dimensions to fit the inch-thick compartments, the thickness of deposit having been predetermined to be such as will, when confined in them, be at a proper density.

For an enveloping pad or cushion of one inch thickness such blocks of pad material may be prepared approximately one and one-half inches in thickness as at 22, Figure 4, and these, when compressed to one inch as they are inserted, fill the thickness in suitably soft density. The blocks will respectively be shaped by the rectangular shearing so that the end portion of any block of filler which comes at an edge of the mattress can be bent over that mattress edge to meet a similar block from below as at the left end of Figure 4; and it should have enough extra stock to permit of the stock at its bend being worked upwards by

the operator so as to make a well filled and firm rectangular angle, to be stitched through obliquely for finish with the usual roll edges, as at left of Figure 2 in the lower left corner, in the manner well known. This corner being initially square and well filled with hair, the driving of a curved needle through it about an inch or two from the apex will draw the adjacent right angled surfaces together at a little distance from the actual apex, along a line of stitching that encloses a small body of hair with the extremity of the angle, thus making the roll which is seen all around the edges in Figures 1 and 3, and tightening the tick upon the hair adjacent thereto, and making the corner firm as portrayed in the upper and lower left corners of Figure 2.

For the making of such blocks it is preferable, though not necessary to employ the above described muslin backing or base 24. Where sisal or the like is used with the muslin, the sisal will usually be stitched to the muslin in longitudinal lines, at intervals. In the case of hair the stitching may be omitted and, by methods already known, loops of the hair be punctured through the muslin 24 as seen in Figure 4 to secure the muslin to the hair surface. In such cases the matted body of hair is self-binding.

Without the muslin backing, the pad material may be assembled in and distributed over the bottom of a shallow box, to required uniform depth, and then while held temporarily between thin, elastically stiff slip sheets, as of paper board or celluloid, be compressedly inserted into their intended compartments, thus setting the blocks of hair therein, and the slip-boards then withdrawn.

The elimination of tufting, with consequent omission of twine, is effected by the combining of the partition-tied springs with partition-tied walls of the casing, the latter tying being by fabric tie-partitions 26 whose terminal seams 27 hold tickings 18, 20, against spreading; also 19, 21. These partition ties may be as frequent as is desired, so that the compacted hair is maintained in its inch-thick sheet form, with no likelihood of its bunching or creeping. The succession of blocks of hair, separated at intervals by partitions 26, extends all around the spring unit. Each partition 26 will be stitched as at 27 to the inner ticking 18 and to the outer ticking 20, or to 19, 21. The muslin base 24 lies loose on the inner ticking, having served its purpose in holding the hair mass in uniform shape until it was packed inside the compartment.

The succession of sectional anti-spreading ties, viz of the pad at top of the spring and of the pad at bottom, makes a total thickness of mattress which is everywhere sufficiently held against bulging; and against dislocation.

It will be observed that the spring unit 10 is wholly unattached to the casing 16. Each is a complete unit in itself, although, for all practical and utilitarian purposes, each is dependent upon the other, the spring unit providing a needed resilient support for the casing; and the casing lending required cushioning and stabilizing characteristics, especially at edges of the mattress where the spring unit alone may be insufficient to hold up the concentrated weight of a person sitting on the edge of a bed, and the solidity of the column of filling extending across the entire thickness of the mattress affords useful reinforcement while imparting also the æsthetic touches that make the whole attractive in general appearance.

According to the invention the spring unit 10 is readily separable from its casing, to permit any needed repairs; and this without any disorganization of the casing 16. One end or one side of the casing has a mouth openable for this purpose. A prepared and suitably located seam, normally closing the mouth; may be ripped, for access to the spring unit; or, preferably, the mouth may be a slit 28, normally closed by any suitable mechanical device such as a zipper fastener indicated at 30.

As represented in the drawings, the slit 28 extends through the end outer ticking 20', mass of hair 22 and the latter's muslin base 24, but the inner ticking 18' extends intact past the slit, and has an opening closed by lacing 32 between 18' and 19 along the upper adjacent edge of the spring unit 10. Consequently, with this construction, access to the spring unit involves only the opening of slit 28, and then a reaching in and unlacing of the inner ticking at 32. The spring unit may then be grasped and manipulated within the casing, as by doubling it over itself, so that it can be worked into form to be drawn out through the slit as shown in Figure 3.

To aid in doubling over the spring a small mouth or slit 34, which is merely a hand hole, may be provided in that end of casing 16 which is opposite the main slit.

The raw thick edges of slit 28 may be surfaced with fabric as at 36, the fabric extending from the outer ticking back through the slit and being fastened to the muslin base 24 of the padding. And a similar construction may be employed for the hand hole 34.

The invention simplifies inner-spring mattress construction and reconstruction at the slight increase of initial cost due to the providing of the interior surrounding wall of ticking. But any slight increase in original cost is more than offset by the greater durability which is incident to the double walled structure and elimination of tie-strings. And the provision for ready removal of the spring unit when desired makes the complete repacking of hair of the mattress unnecessary, as when a spring or string gives out, in mattresses of earlier type. It eliminates the need for a repair person of trained manual dexterity in the packing of hair, and enables the repair to be effected by a person of ordinary skill in the handling of burlap and springs.

The envelope casing and a method of its manufacture are features requiring special description, since the double wall style, with interior seams, and partitions going all around the mattress between the walls, and the filling of those walls cannot be accomplished by methods ordinary in the mattress industry, and are matters of invention.

The tickings for the several tops and bottoms may first be cut with their attached boxings. In the design and method of manufacture illustrated, to which however the invention is not limited, for variations may be made, the boxings 20' and 18' are respectively integral with the exterior and the interior bottom tickings 20 and 18, comprising flaps at sides and ends of the mattress, to be turned up and stitched to the tickings 21 and 19, respectively, to make the whole into the shape of an exterior box and an interior box.

The top 19 of the interior box is a sheet of ticking cut to approximately the dimensions of the top of the spring unit 14. The interior bottom 18 has the same dimensions (covered by the spring unit in Figure 4) with integral flaps 18'

wide enough to be folded up around the edges of the spring unit and be sewed to the edges of the interior top 19. Above the interior top 19 is the exterior top 21, of equal size except that it extends about an inch further at each margin in order to cover the inch thick padding which is to lie around the edge of the spring unit as seen at the left of Figure 4. And underneath all is the exterior bottom 20, of equal size and having integral flaps 20' to be folded up outside of the hair 22 seen at the left in Figure 4, and sewed to the edge of the exterior top 21. In all cases suitable extra allowance will be made for hems and seams.

Also the partitions 26 are to be prepared, these being strips of stout fabric, as ticking, or preferably tape, whose bent flange-like edges for holding the seams are exaggerated in the drawings. The tickings having been cut to proper size, the strips 26 may be stitched in position, crossing the outer top 21 and bottom 20 and the flaps 20' along dotted lines 17 at intervals of a foot, or as may be desired. The edges of 18' and 19 of the inner box may be sewed together with a French seam inside out and a lacing provided at 32 for the convenient opening, and also at 34. Then the top exterior ticking 21 is to be placed on the top interior ticking 19, and the free edge of that strip 26 which is to be nearest one end of the mattress is to be stitched under 27 to the top 19 of the interior box. As the top edges are free, the whole exterior top can be turned back out of the way, and as access of hand or machine can be had to the seam on the interior of the inner box, this is possible to be done. Moving along, the next partition 26 may similarly be sewed in place; and so on, one by one to the other end of the mattress. If preferred one may begin in the middle and work first toward one end and then toward the other. The sewing operation will be performed from that side of the partition strip 26 which is toward the end of the mattress cover which as yet remains open. The bottom partitions 26 may similarly be attached to the interior bottom 18.

The inner box is now complete, and outside of it, above and below, are inch-thick compartments, with ends open at both edges of the mattress. The operation of inserting the blocks of padding comes next and is best performed when there is an actual or a dummy spring unit 14 within the inner box. The filling, being already cut in compartment fitting shapes as previously described, can be entered endwise in one of the compartments, seized with the hands or suitable tongs within the compartment, and drawn in to its final position shown at the left in Figure 4. If desired, each pair of upper and lower fillings can be made integral at the place where their ends are seen bent together in Figure 4, and the pair be drawn in as a single piece of U-shape.

Next the flaps or boxings 20' are to be folded up and stitched to the exterior top ticking 21; and then the boxing flaps to be stitched to each other at the corners. The slits 28 and 34 in the end flaps, and the zippers or other fastenings therefor, were preferably fixed in the end flap before the latter was sewed to the top. The filling piece which is to occupy the end compartment is preferably shaped preliminarily so as to conform to the line of parting 28, and may have allowance of the extra stock of hair which is to be forced upward by the operator to make a full corner, and a roll edge.

The preferred order of steps above described, of sewing the cross partitions first to the outer top

and outer bottom, instead of first to the inner top and inner bottom has the practical advantage that the partition strip for bottom and its integral boxings, as illustrated, in the middle of the lower part of Figure 4, can be a continuous strip put on with a single operation, and having suitable cut-outs to provide for the folding of the flap and its section of the partition upward to make the box.

And the building of the structure as a whole from the inside outward,—first the inner box, while it can be everted, if desired, for the making of a French seam; then the compartments, progressively along the length of the mattress, but leaving their ends open; then the filling of compartments by draft of cohering masses of padding, one into each, with projecting cohering end portions of the same, to be bent over the edges of the mattress; and then the enclosing of these bent-over portions simultaneously with the closing of the ends of the compartments, by the turning up of the boxings;—this from-within-outward procedure permits easy access to and perfect construction of the interior walls, seams and fillings which would not otherwise be accessible in a practicable manner.

One could get at the spring unit without seriously disturbing the packed padding, and without the zipper door, by ripping the top seam in the outer ticking at the end corresponding to where the lacing 32 is proposed for the inner ticking. The principal advantages of the invention can thus be had, (although less conveniently) without the cut in the midst of the end which is illustrated. The presence of such a seam between 20' and 21, with a cooperating seam between 18' and 19, constitutes means for opening one of the padded doubled walls for passage of the spring unit.

In Figure 4, which is a schematic representation, the upper ticking 21 is sectioned on the plane of the edge of the spring unit.

When built according to the method described, practically all of the stitching to make the two-walled interiorly-partitioned envelope can be executed by machine, and neither this nor the filling requires more than ordinary skill.

Another advantage which results, eliminating the need for another extraordinary sort of skill, is that the edges of the mattress thus made have inherently a resistance to displacement such as has hitherto been attained by the making of the so-called imperial edge. This is a hand work operation laboriously performed by deep-stitching of hair to the edge wall of the mattress, and never satisfactorily applied to an inner spring mattress, so far as I am aware, because, when attempted, the deep stitches are apt to enter the spring unit, with resulting complications and danger of dislocations and breakages of various sorts. An element which contributes to the new inherent resistance is the fact that the hair is secured, by looping or stitching, and by compression, on the muslin fabric 24, which fabric is a strong continuous sheet extending from within the top of the mattress over the corner and down the edge, thus holding the hair at the edge against sagging with a firmness even greater than that attainable by the imperial edge. And it will be observed that, in the absence of the muslin, a similar effect can be gained by sewing the edge padding to the boxing wall 18', after that inner box has been made.

In the construction of the present invention the inner ticking wall supports hair under compression close to the outer ticking wall, and so

makes the stiffness of padding at the very edge, an effect heretofore attained only by the imperial edge.

I claim as my invention:

1. A padded casing for a mattress inner-spring unit comprising inner and outer top tickings with intervening strips secured to both, making cells for padding, and with padding therein; inner and outer bottom tickings, with intervening strips, cells and padding; and with inner and outer boxings, respectively attached to the inner and outer tickings, between which edge boxings there are continuations of said intervening strips and the cells made thereby, and padding, compressed edgewise of the mattress by the two boxings; and fabric strips, on which said paddings are mounted, this mount being continuous over the corner between the top and bottom cell spaces and the space between boxings, whereby firmness of the edge portion of the mattress is promoted.

2. A mattress comprising an inner multiple-metallic-spring unit occupying substantially the whole area of the mattress, and a unit pad continuously and completely enveloping the spring unit, and confining it; said spring unit being sufficiently flexible to be bent transversely as a unit, while within the pad envelope; and there being disjunctive openings through said pad envelope, in diverse walls thereof, one constituting a hand hole for access to bend the spring unit, and the other constituting a mouth through which the bent spring unit is removable.

3. A mattress comprising an inner multiple-metallic-spring unit occupying substantially the whole cross-section of the mattress, from edge to edge of the mattress; combined with an enveloping cushion, comprising filling material with sheet material holding that filling, which cushion constitutes a unitary envelope continuously and completely enveloping the spring unit, and confining it; and there being a line of disjunctive cleavage through said continuous envelope, extending along an edge of the spring unit, for providing a mouth opening through the cushion, large enough for the passing of the spring unit therethrough when the mouth is open; and another opening through the enveloping cushion at a distance from the first mentioned opening and cooperating therewith for the handling of the spring unit between removed and confined positions.

4. An inner spring mattress, comprising an enveloping exterior cushion-unit combined with a removable interior spring-unit; in which mattress the said interior unit is a group of individual metallic springs distributed over the area of the mattress and having means securing them in position relative to each other in their said distributed relation so that they are movable as a unit independently of their said exterior envelope, said spring-unit when expanded having an approximately rectangular normal cross section; and in which mattress the said exterior unit is a flexible cushion of fibrous filling and fabric walls confining the filling and covering completely the sides and the edges of said interior unit, crossing the edge thickness of the said interior unit completely from side to side of the mattress; through which cushion there is a disjunction, extending in a line along an edge of the interior unit, the lips of which disjunction are normally closed and abutting together and have a breadth of mutually abutting areas embodying the horizontal thickness of the cushion at that edge of the mattress,

which thickness is of the order of thickness of cushion that is ordinary elsewhere around the edges of the mattress; the linear extent of said disjunction of the cushion-unit being sufficient to permit those lips to constitute a mouth whose area, when the lips are separated and open at the said line of disjunction, is co-ordinated to the area of the said rectangular normal cross-section of the interior spring-unit in its ex-

panded condition; whereby, in the mattress, the multiple-metallic-spring-unit is completely cushion-enclosed and all its edges cushion-reinforced and yet is capable of being passed as a unit through said mouth, when the enveloping cushion-unit is opened to constitute a mouth at its said disjunction.

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