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METHOD OF MANUFACTURING FLEXIBLE STAYS

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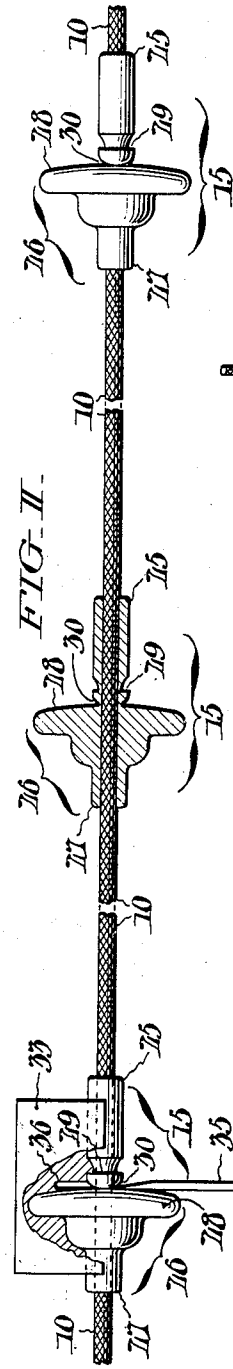


FIG. II.

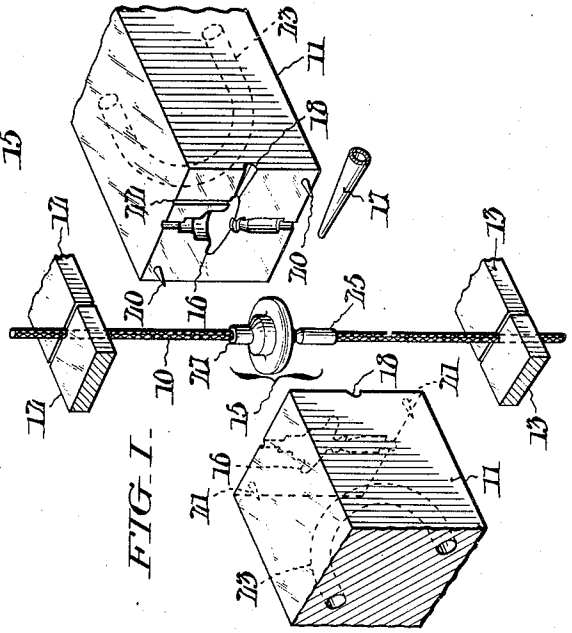


FIG. I.

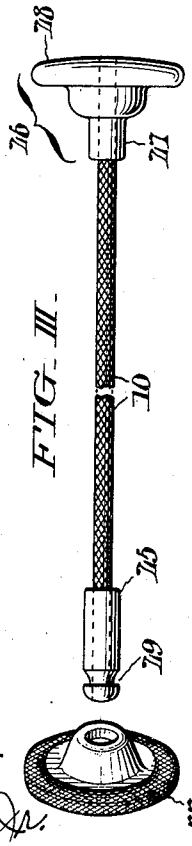


FIG. III.

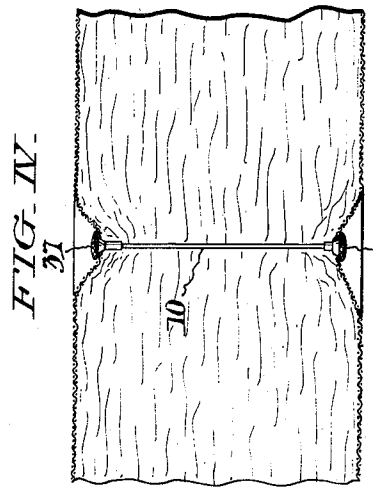


FIG. IV.

WITNESSES:

Woodbury Stevenson

William Bee, Jr.

INVENTOR:

Julius R. Bux,

BY Paul & Paul

ATTORNEYS.

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METHOD OF MANUFACTURING FLEXIBLE STAYS

Julius R. Bux, Melrose Park, Pa.

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2 Claims. (Cl. 29—148)

My invention relates to flexible stays and the like, such as are used for mattresses, cushions, pads, and upholstery, etc., and comprises a new and simplified form of stay, and a new method of fabrication. I aim to simplify, expedite, and cheapen the manufacture of flexible cord stays without any sacrifice of strength, quality, or good appearance. Other features and advantages of the invention will appear from the following explanation and from the description of species or forms of embodiment of the invention, or from the drawing. All the features and combinations shown or described are of my invention, so far as novel.

Cord stays at present in very common use comprise a length of textile cord with an externally shouldered button-head carrier on each end, and a snap-head or button on each carrier, locked thereto by engagement of its resilient snap means behind the carrier shoulder(s). Sometimes tufts rather than buttons are used. Generally, one button-head is attached to the stay before it is inserted through a mattress or the like, and the other head is applied afterward. In equipping a length of cord with button-head carriers, the practice is to provide its ends with sleeve-tips of sheet metal tightly wrapped and gripped around it, like the metal tips of shoe-laces, and then to slip over these tips seamless metal caps having annular grooves therein adjacent their (closed) outer ends, finally securing these caps by crimping their edges inward behind those of the sleeve-tips.

While the attachment of the button-head carriers to the cord thus produced is generally effective, the method is complicated and relatively costly, even though performed entirely by machinery. A number of operations are involved in making the sheet metal blanks for the sleeve-tips, and in applying, closing, and securing them on the cord, etc. Likewise, a number of operations are involved in making the seamless metal caps, and in placing and securing these caps on the cord tips. Moreover, the completed stays are expected to stand a pull of some 50 or 60 lbs. before the button-heads come off; and this exacting requirement cannot be met unless all the mechanisms involved in the various operations work perfectly, and are perfectly coordinated with one another.

In accordance with my invention, I do away with the large number of operations and the resulting drawbacks by casting carriers for buttons, tufts, or the like directly on the stay-cord. As hereinafter described, a series of double carrier-members are cast at suitable intervals along a continuous textile cord, and these castings and the cord are subsequently cut through, thus providing cast button-head carriers on the ends of each resulting cord length. In this procedure, one button-head of each stay may be formed integral with the corresponding double carrier-member, by casting it as part of this carrier-member, and the said member may also be cast with a shoulder for coaction with a snap-button. Thus a simple die-casting operation followed by a very simple further operation produces a completed stay, with a button on one end and a shouldered carrier on the other, ready for insertion in a mattress or the like, and for the subsequent application of a snap-button or head on said other end, as usual heretofore. Moreover, the casting of the carriers on the stay-cord assures a very strong and reliable attachment.

The pressure used in die-casting to inject the molten metal into the mold cavity around the stay-cord forces the metal into the external recesses and interstices amongst the component threads, yarns, and fibers of the cord, and this intimacy of contact and grip of the metal on the cord is fortified by the natural volumetric change of the metal in cooling and solidifying. The effective strength of the stays thus produced easily equals or surpasses that of the best stays made by the older methods,—which I have already described.

In the drawing,

Fig. I is a diagrammatic perspective view illustrating the die-casting of a carrier member on a continuous length of stay-cord.

Fig. II is a side view (on a larger scale than Fig. I) of a fragmentary length of stay-cord with a series of such carrier members cast thereon, one of these being shown in longitudinal mid-section, and another being shown associated with severing means.

Fig. III shows a completed stay, with a button cast integral with one of its carriers, and a separate snap-button or head for application to its other carrier.

Fig. IV shows a completed stay in service in a mattress, with a snap-button-head applied.

Fig. I illustrates (somewhat diagrammatically) the operation of making the die-castings on a flexible textile cord 10. This cord 10 may be of any suitable character and construction, though a plaited or braided cord is generally more suitable than a twisted one, as being stronger and less subject to stretching. Round cord is preferable; or if flat cord is used, it may be kept rolled or otherwise compacted into a more or less round form where it passes between the casting dies 11, 11 as shown in Fig. I. As here shown, the cord 10 extends taut between suitable grippers 12, 12 and 13, 13 at opposite sides of the dies 11, 11, above and below the latter. These grippers 12, 12 and 13, 13 may be suitably reciprocated and operated to feed the cord 10 lengthwise, intermittently, while the dies 11, 11 are separated or open,

as here shown. Feeding mechanism of this character is well known.

Fig. I represents the condition of things when a double member 15 has just been cast on the taut cord 10, and the die-blocks 11, 11 have been separated preparatory to feeding the cord 10 lengthwise into position for the casting of another such member 15. During each casting operation, of course, the die-blocks 11, 11 are brought together so that the recesses 16, 16 in their abutting faces form a mold-cavity for a double member 15; and while they are held pressed together, molten metal is injected into the mold cavity (under suitable pressure), through a nozzle 17 whose tapered end engages and fits snugly in a tapered opening formed by semi-circular grooves 18, 18 in the die faces. As shown, the die-blocks 11, 11 have suitable tapered dowel-pins and holes 20, 21 to insure accurate registry of the recesses 16, 16 and one of them has an air-vent groove 22 in its face, leading upward from the mold cavity. Provisions for cooling the die-blocks 11, 11 are here diagrammatically represented by a water-circulating duct 23 in each of them.

In general, the construction and operation of the casting dies and the associated mechanism may correspond to that used in casting fastening lugs for slide fasteners directly on the fabric tapes which carry them. Such mechanisms are capable of extremely rapid operation, so that castings can be made at a rate of one to several hundred a minute.

Fig. II shows a length of cord 10 with a series of (three) double members 15 cast thereon, one of these appearing in section, the whole constituting a blank for the manufacture of stay-cords such as shown in Fig. III. Each of these members 15 is designed to provide carriers for adjacent ends of two successive stay-lengths of the cord 10, and comprises a right-hand button-carrier portion 25 in the form of a sleeve around the cord, and a left-hand portion 26 which as here shown also includes a carrier sleeve 27, as well as a button-head 28, constituting in effect an integral extension or enlargement of this sleeve 27. The carrier sleeve portion 25 has a retaining shoulder 29 on its end adjacent the other portion 26, here shown as formed by an annular groove at a short interval to the right of the head portion 28. The retentively shouldered anchorage sleeve portion 25 lies at or extends from the right-hand side of the portion 26, which in the completed stay becomes the outer side of its button-head or button 28, Figs. III and IV, while the sleeve portion 27 extends from the opposite side of the button-head. Preferably, the member 15 is locally weakened between its portions 25 and 26, as by reducing or annularly grooving it at 30, to facilitate severing it. The groove 30 may be of curved profile at one side, so that after severance the end of carrier 25 will be rounded more or less hemispherically.

One mode of effecting the severance is shown at the left of Fig. II, where the member 15 is shown engaged in a coformative semi-circular recess in a support 33. A cutting instrument 35 is (fragmentarily) shown engaged with the reduced portion 30 of the member 15, ready to cut through it and (coincidently) through the cord 10 within it. This cutter 35 may consist of a sharp-edged shearing blade or knife, or may be a sharp-edge revolving disc cutter, or may be of any other suitable character. The support 33 is shown with a recess 36 behind the edge of the cutter 35, to afford clearance for receiving the latter when it cuts through member 15 and cord 10. Of course, the severing operation at the left of Fig. II may be performed in synchronism and concurrently with the die-casting operation in Fig. I, by feeding the cord 10 along from the dies 11, 11 to the cutting devices 33, 35, and operating the latter during the pauses of the cord, while the casting is taking place.

Fig. III shows a completed stay such as results from cutting through any two adjacent members 15 on the cord 10. It has the cast-on carrier 27 with integral button enlargement 28 on its right hand end, and the cast-on carrier 25 on its left-hand end, with a shoulder formed by the annular groove 29 adjacent the outer end of this carrier, which is more or less rounded to facilitate entry into the socket opening of the corresponding snap-button 37 and engagement with resilient locking means (not shown).

Fig. IV shows the stay of Fig. III inserted through a mattress. The cast-on metal button 28 is shown at the lower side of the mattress; while the snap button 37 (which may be covered with cloth to harmonize with the mattress cover) is shown at the top side of the mattress. Of course, the cast-on button 28 may also be covered with cloth, if desired, as suggested in Fig. IV.

Having thus described my invention, I claim:

1. A method of fabricating stays for mattresses, cushions, pads, or upholstery, each comprising a length of cord with dissimilar cast-on parts at its opposite ends, the part at one end of the cord length being a button and the part at its other end being a shouldered anchorage sleeve of smaller radial dimension than said button; which method comprises casting around a cord, at intervals corresponding to the desired stay-cord length, a series of identical unitary members each combining in itself the said dissimilar parts for the opposite ends of a stay-cord length, to wit, a button portion and a sleeve portion of smaller radial dimension than said button portion extending from the side of said button portion and shouldered adjacent but at an interval from the said button portion; and severing adjacent identical unitary members between the sleeve shoulders and button portions of said members, also correspondingly severing the cord, whereby a series of similar stays are produced.

2. A blank for the manufacture of stay-cords comprising a flexible cord with a series of unitary members cast therearound and thus fixed thereon, at intervals corresponding to stay-cord length, each of said members including a button portion and a sleeve portion of smaller radial dimension than said button portion extending from the side of said button portion and shouldered adjacent but at an interval from said button portion and also a sleeve portion of smaller radial dimension than said button portion extending from the side of said button portion opposite the adjacent shouldered sleeve portion; said blank being divisible, by severance of said unitary members and said cord between the sleeve shoulders and the button portions of said members, into stays each comprising a length of cord with a button fixed on one end thereof and a shouldered sleeve fixed on the other end thereof.

JULIUS R. BUX.