Jan. 19, 1943. L. A. YOUNG 2,308,849

APPARATUS FOR MANUFACTURING UPHOLSTERY PADS

Filed Oct. 13, 1941

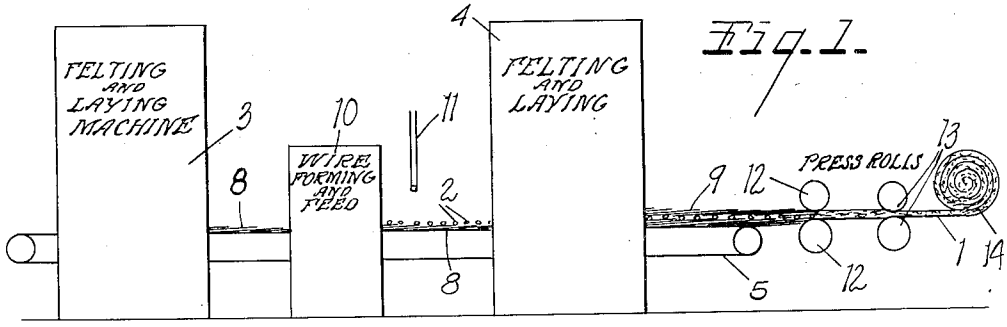


Fig. 1.

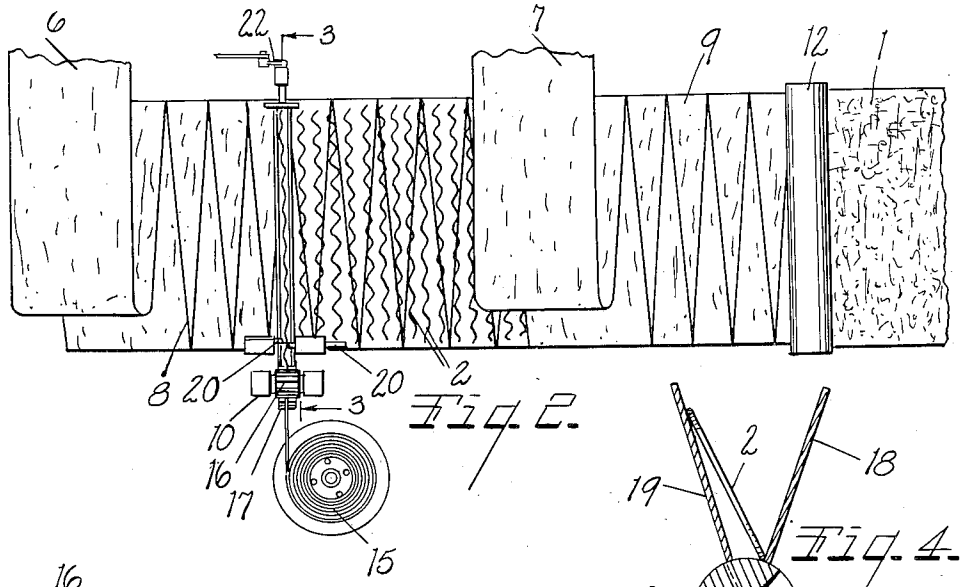


Fig. 2.

Fig. 4.

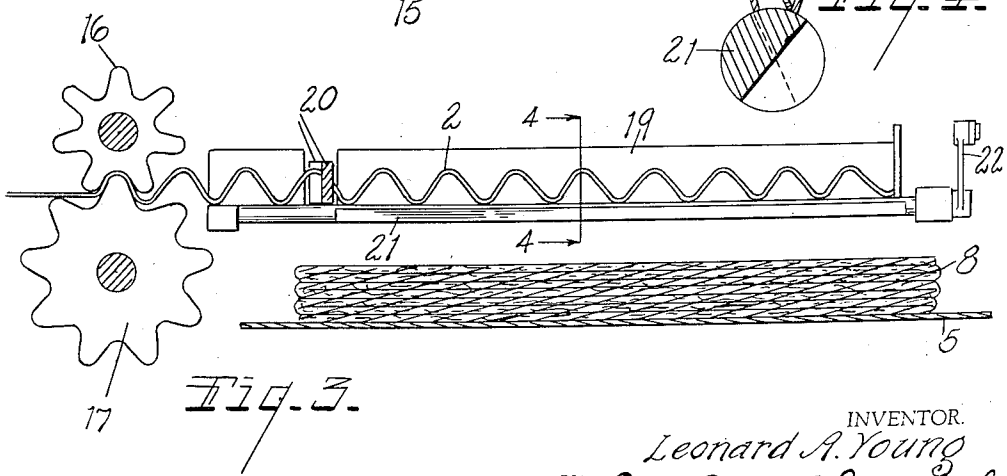


Fig. 3.

INVENTOR.
Leonard A. Young
BY Earl O. Chappell
ATTORNEYS.

Patented Jan. 19, 1943 2,308,849

UNITED STATES PATENT OFFICE

2,308,849

APPARATUS FOR MANUFACTURING UPHOLSTERY PADS

Leonard A. Young, Detroit, Mich.

Application October 13, 1941, Serial No. 414,794

5 Claims. (Cl. 154—29)

This invention relates to improvements in apparatus for manufacturing upholstery pads.

This is a continuation in part of my application, Serial No. 354,224, filed August 26, 1940, and entitled Upholstery pad, apparatus and method of making the same.

The main objects of this invention are:

First, to provide an apparatus for manufacturing an upholstery pad well adapted for use on automobile spring cushions, body upholstery, mattresses, furniture and the like, which has desired qualities of softness and yieldability and in which the fibrous material thereof is effectively bound together whereby the pad is well adapted for use on a spring assembly or other supporting surface.

Second, to provide an apparatus of the type described of which the output is continuous and rapid, and which enables pad structures of the type described above to be very economically produced.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a diagrammatic elevational view of the apparatus of my invention, the parts being shown in conventionalized form.

Fig. 2 is a diagrammatic top plan view of the apparatus, illustrating the manner in which the various component parts of the padding are delivered and associated by the coacting mechanisms of the apparatus.

Fig. 3 is an enlarged view in section on line 3—3 of Fig. 2 generally illustrating a mechanism constituting a part of the apparatus whereby a wire reinforcing element is formed and applied to a previously fabricated constituent of the padding, and

Fig. 4 is an enlarged fragmentary view in section on line 4—4 of Fig. 3 further illustrating the manner in which the formed and severed reinforcing elements are delivered to the padding.

This invention relates to an apparatus for fabricating padding suitable for use on a cushion structure having a plurality of coil springs, the padding being assembled on the springs in the relation illustrated in the above identified application Serial No. 354,224, or in other applications where the use of a soft flexible reinforced pad is indicated.

My improved upholstery pad, designated 1 in the drawing, is designed to be superimposed upon a spring assembly. The pad is of substantial and preferably of uniform thickness, being formed of fibrous material which is, for certain qualities of pads, of cotton or cotton waste or other fibrous waste material now largely employed in upholstering. This cotton waste material and other waste material is of short fiber and while the materials felt quite satisfactorily the resulting pad has relatively little strength and when such a pad is used upon a spring assembly, for example, the load on the cushion or mattress, frequently quite localized, distorts or ruptures the pad, working it down between the springs. As it has substantially no inherent resiliency the cushion or mattress is permanently damaged or distorted and its appearance injured by depressions or pockets.

To reinforce and bind the fibrous pad material together and to provide yielding supports therefor when it is superimposed on a spring structure and subjected to the flexing incident thereto, I incorporate resilient strands 2 preferably of wire and preferably zigzag or sinuous, wire strands, these strands being laid in spaced parallel relation as is illustrated in the drawing. As stated, the strands are preferably formed of resilient wire and, owing to their sinuous form, may yield in a plurality of directions and also serve to effectively bind the fibers of the pad material, and while yielding therewith return the pad to its normal position when a portion thereof has been subjected to pressure or depressed. The zigzag formation also serves to prevent the strands from shifting or working longitudinally or lengthwise within the pad as well as covering or embracing a large area.

In the accompanying figures, I illustrate certain steps of my method and the apparatus of my invention. Machines for handling fibrous material and forming the same into thin webs of substantially uniform thickness are known to the industry, such machines being commonly designated as garnetting machines. They are provided with attachments for laying the web of loosely sheeted material with a back and forth stroke for building up a mat of the desired thickness. The numerals 3 and 4 (Fig. 1) indicate such machines or apparatus and these machines are disposed in spaced relation relative to a conveyor 5 upon which the webs 6 and 7 produced by the machines are laid with a back and forth stroke as stated, this taking place while the conveyor is in motion and thereby producing multiply mats of material with the edges of the webs

in overlapping relation as indicated in Fig. 2. The first machine produces a bottom multi-ply mat of fibrous material designated by the numeral 8, while the product of the second machine 4 is superimposed upon that of the first machine and produces a multi-ply mat 9.

Between the machines 3 and 4, I provide a machine designated by the numeral 10 adapted to form the corrugated or sinuous strands 2 from resilient wire stock, and superimpose the same upon the bottom multi-ply web 8, as shown in Figs. 1 and 2. For certain fibrous material, for example sisal, which does not have felting characteristics such as to enable the upper and lower multi-ply mats to become felted or bound together when pressure is applied thereto I apply an adhesive to the lower multi-ply mat 8 and this may be efficiently accomplished by means of the suitable nozzle spray device 11 as indicated in Fig. 1. Latex forms a suitable adhesive.

It will be seen that the second multi-ply mat 9, the product of the second machine 4, is superimposed upon the first multi-ply mat, the product of the first machine 3, and upon the reinforcing strands 2 that have been superimposed thereon. It will be noted that the ends of the strands terminate in spaced relation to the edges of the mats.

After the multi-ply webs and the reinforcing elements are thus superimposed, they are passed between pressure rollers 12, 12 and 13, 13, the rollers 13 being set substantially closer together so that successively increased pressures are applied to compact the mats.

From the rear rolls 13, the product is formed into a roll 14 to be later cut into sections, or it may be cut into sections as delivered from the rolls 13.

Where the material has felting qualities, as cotton or various forms of waste material, and by waste material I mean waste such as commonly used in padding, shredded or defibered fabrics, waste from mills and the like, the fibers of the superimposed mats will become felted together or interlocked as a result of being subjected to pressure of the rolls, and also the several plies will become substantially felted together or interlocked.

Because of the fact that web forming and laying machine (quite commonly called garnetting machines) such as I have diagrammatically illustrated at 3, 4 are well known in the art, I do not deem it necessary to illustrate the same in detail. Likewise suitable means for driving the same in properly timed relation to the advance of the conveyor will readily suggest themselves to those skilled in the art. Inasmuch as it is believed that a detailed illustration of such structure would tend to complicate and encumber the application I have omitted the same. However, in Figs. 2, 3 and 4 I illustrate somewhat diagrammatically a suitable mechanism for forming and feeding the reinforcing strands to operative position relative to the advancing web. This comprises a roll of wire stock 15 mounted on a vertical spindle at one side of the conveyor, the stock being drawn from the roll and formed into its sinuous zigzag outline by means of a pair of driven coacting corrugated or toothed forming elements 16, 17. As discharged from these elements the wire has the desired outline and it is fed thereby between the sides 18, 19 of a V-shaped trough or feed hopper. When a strand length has been delivered into the hopper a pair of coacting cutter elements 20, 20 are operated by suitable instrumentalities to sever the wire into desired lengths.

The bottom of this hopper is constituted by a discharge gate 21 extending longitudinally of and beneath the hopper sides, this gate, at the portion thereof which is immediately beneath the hopper, being semi-circular in section. It is oscillated or intermittently rotated by a suitable crank 22 to the end that when it is in the position illustrated in solid lines in Fig. 4 the formed and severed strand 2 is sustained in the hopper, but when oscillated or rotated to the position illustrated in dotted line in Fig. 4 the strand drops downwardly onto the previously deposited web 8. Immediately after one strand has been discharged in this manner the hopper gate is closed. This strand laying mechanism is appropriately driven in timed relation to the advance of the conveyor by means which will be readily devised by those skilled in the art to the end that strand elements are formed and deposited in desired spaced relation longitudinally of the product.

The foregoing machine is continuous and rapid in operation and produces a reinforced body of uniform thickness, well adapted for the above described purposes in an exceedingly economical manner.

An embodiment of the invention which incorporates the principles of the invention in a highly desirable manner has been illustrated and described. It should be understood that the foregoing terminology is used only descriptively rather than in a limiting sense, and with full intention to include equivalents of the features shown and described, within the scope of the following claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An apparatus for making upholstery pads for spring structures and the like, comprising means for forming feltable fibrous material into a web of uniform thickness, means for laying the web on a moving conveyor with a back and forth folding movement transversely of the conveyor and while it is in motion providing a multi-ply mat-like web with the several plies thereof in edge lapping relation, means for superimposing on such mat-like web transversely thereof a plurality of reinforcing strands of wire bent to zigzag form, a second means for forming feltable fibrous material into a second web of uniform thickness, means for laying such second web on the first mat-like web and the reinforcing strands superimposed thereon with a back and forth movement transversely of the conveyor while it is in motion, providing a second multi-ply mat-like web with the several plies thereof in edge lapping relation, and means for applying pressure to the said superimposed multi-ply mats of fibrous material with the wire reinforcing elements therebetween whereby to provide a pad of fibrous material with reinforcing elements incorporated therein and constituting binding and reinforcing means for the fibrous material of the pad and supporting means for the pad when it is superimposed on a spring structure or the like, the ends of the reinforcing strands being in spaced relation to the edges of the pad.

2. An apparatus for making upholstery pads for spring structures and the like, comprising means for forming fibrous material into a web of uniform thickness, means for laying the web on a moving conveyor with a back and forth

folding movement transversely of the conveyor and while it is in motion, providing a multi-ply mat-like web with the several plies thereof in edge lapping relation, means for superimposing on such mat-like web transversely thereof a plurality of reinforcing strands of wire bent to zigzag form, a second means for forming feltable fibrous material into a second web of uniform thickness, means for laying such second web on the first mat-like web and the reinforcing strands superimposed thereon with a back and forth movement transversely of the conveyor while it is in motion, providing a second multi-ply mat-like web with the several plies thereof in edge lapping relation, and means for applying pressure to the said superimposed multi-ply mats of fibrous material with the wire reinforcing elements therebetween whereby to provide a pad of fibrous material with reinforcing elements incorporated therein and constituting binding and reinforcing means for the fibrous material of the pad and supporting means for the pad when it is superimposed on a spring structure or the like, the ends of the reinforcing strands being in spaced relation to the edges of the pad.

3. An apparatus for making upholstery pads for spring structures and the like, comprising means for forming fibrous material into a web of uniform thickness, means for laying the web on a moving conveyor with a back and forth folding movement transversely of the conveyor and while it is in motion providing a multi-ply mat-like web with the several plies thereof in edge lapping relation, means for forming and superimposing on such mat-like web transversely thereof a plurality of reinforcing strands of wire bent to zigzag form, means for applying adhesive to the upper surface of said mat-like web, a second means for forming feltable fibrous material into a second web of uniform thickness, means for laying such second web on the first mat-like web and the reinforcing strands superimposed thereon with a back and forth movement transversely of the conveyor while it is in motion, providing a second multi-ply mat-like web with the several plies thereof in edge lapping relation, and means for applying pressure to the said superimposed multi-ply mats of fibrous material with the wire reinforcing elements therebetween whereby to provide a pad of fibrous material with reinforcing elements incorporated therein and constituting binding and reinforcing means for the fibrous material of the pad and supporting means for the pad when it is superimposed on a spring structure or the like, the ends of the reinforcing strands being in spaced relation to the edges of the pad.

4. An apparatus for making upholstery pads for spring structures and the like, comprising a conveyor, a plurality of means spaced longitudinally of the conveyor for forming fibrous material into webs of substantially uniform thickness and laying the same on the moving conveyor with a back and forth folding movement transversely of the conveyor and while it is in motion, thereby providing a multi-ply mat-like web the several plies of which are in edge lapping relation, the output of the second means being superimposed upon the output of the first means, means for positioning wire strands in parallel relation extending transverse the travel of said conveyor upon the output of the first means and prior to the superimposing thereon of the output of the second means, and means for applying adhesive to the output of the first web forming means prior to the superimposing thereon of the output of the second forming means, and means for applying pressure to the combined outputs of the said web forming means after they have been superimposed with the reinforcing strands between them.

5. An apparatus for making upholstery pads for spring structures and the like, comprising a conveyor, a plurality of means spaced longitudinally of the conveyor for forming fibrous material into webs of substantially uniform thickness and laying the same on the moving conveyor with a back and forth folding movement transversely of the conveyor and while it is in motion, thereby providing a multi-ply mat-like web the several plies of which are in edge lapping relation, the output of the second means being superimposed upon the output of the first means, means for positioning wire strands in parallel relation extending transverse the travel of said conveyor upon the output of the first means and prior to the superimposing thereon of the output of the second means, and means for applying pressure to the combined outputs of the said web forming means after they have been superimposed with the reinforcing strands between them.

LEONARD A. YOUNG.