

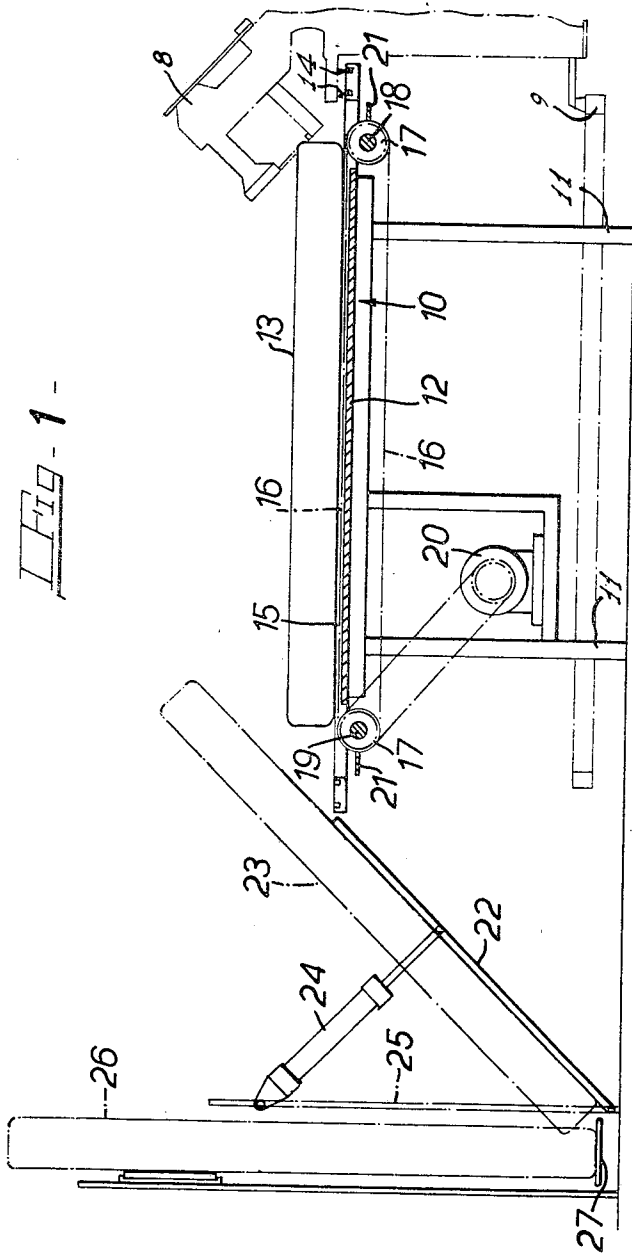
Jan. 13, 1970

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APPARATUS FOR USE IN THE MANUFACTURE OF
MATTRESSES AND THE LIKE ARTICLES

3,490,061

Filed April 15, 1968

3 Sheets-Sheet 1



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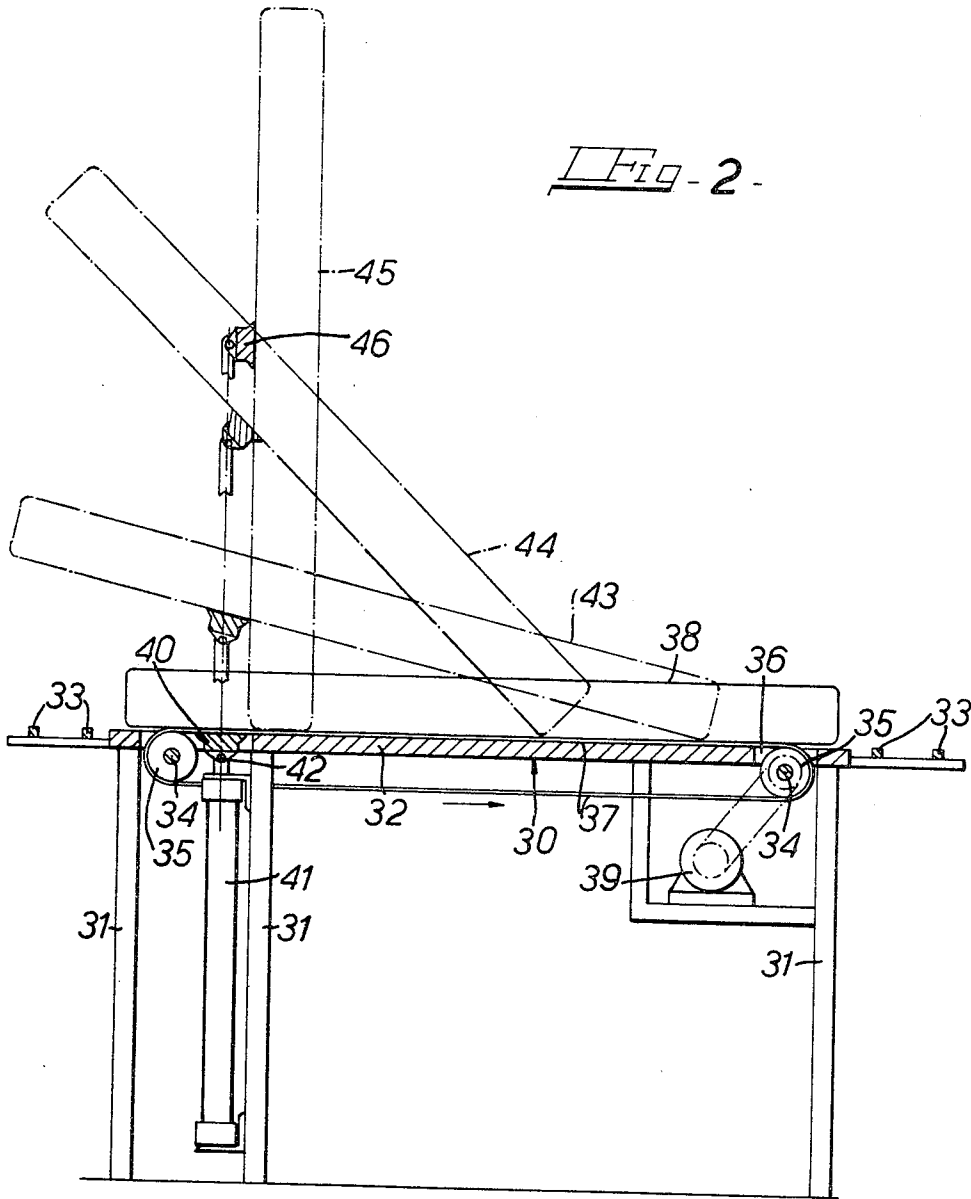
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Fig. 2



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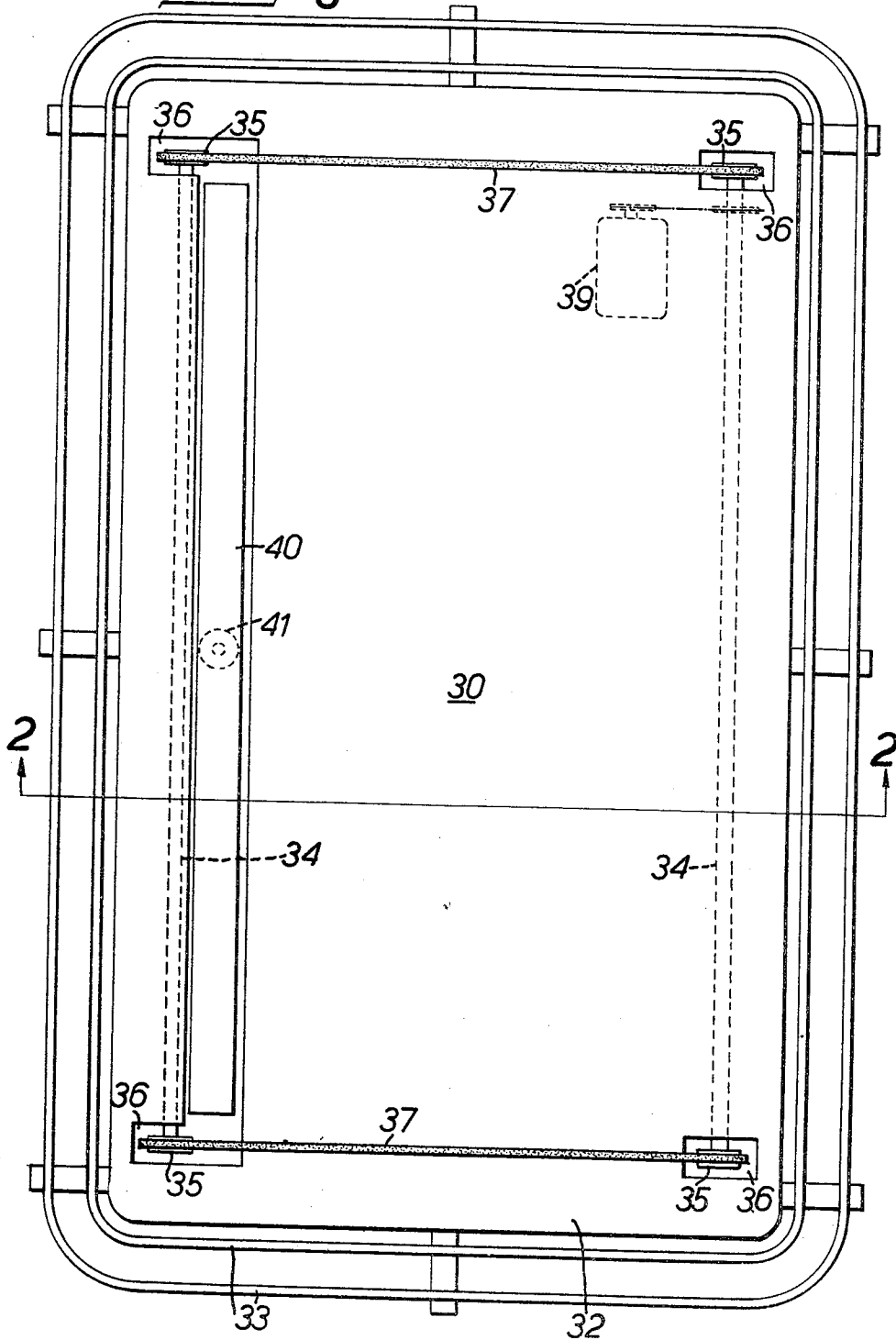
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Fig - 3 -



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APPARATUS FOR USE IN THE MANUFACTURE OF MATTRESSES AND THE LIKE ARTICLES

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4 Claims

ABSTRACT OF THE DISCLOSURE

Known apparatus for sewing the edges of mattresses comprises a table for a mattress, and a sewing machine mounted on a carriage which moves round the mattress along a peripheral rail. The invention provides mechanism for turning over a mattress on the table. The mechanism comprises an endless conveyor, which moves the mattress towards one side of the table and which may comprise two spaced parallel bands with their upper runs overlying the table, and lifting means which may comprise a vertically movable carrier with an elongated head which extends between the bands of the conveyor near that side of the table and is pivoted to the carrier about an axis parallel with its length. As the conveyor moves the mattress the head is raised by the carrier until the mattress is up-ended. The conveyor is stopped and the head is then lowered. Finally the conveyor is re-started momentarily to tip the mattress over.

This invention relates to apparatus for use in the manufacture of mattresses and the like articles. The term mattresses and the like articles is used herein to include any relatively extensive upholstered units, whether they are intended for use as mattresses or as seats or as seat backs or otherwise, the term also being used herein to denote these articles in partially completed form.

The invention is particularly concerned with apparatus of the kind comprising a support for a mattress or the like article, a sewing machine movable around the support in a generally horizontal path, and guide means for the sewing machine, the arrangement being such that in use the sewing machine performs a stitching operation around the periphery of a mattress or like article on the support. Typical apparatus of this kind is the apparatus used for sewing the top or bottom ticking of a spring-centre mattress to a preformed fabric border, the apparatus comprising a table on which the partially completed mattress is supported, and peripheral rails around which a sewing machine moves in use. Apparatus of this kind is described and illustrated in Patent No. 2,915,027, granted to L. I. Smith and assigned to Slumberland Limited.

Difficulty is experienced, with this kind of apparatus, in removing the mattress or like article after it has been stitched, and it is usually necessary for two people to move it aside. An object of the present invention is to overcome or reduce this difficulty.

According to the present invention apparatus of the

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kind outlined above is characterized in that the support comprises a conveyor operative in use to enable the article to be moved from the support without fouling the sewing machine and guide means.

The conveyor may be of the kind, such as a roller-conveyor, which is not powered but enables the article to be pushed readily over it. Preferably, however, the conveyor is power-driven.

The conveyor may comprise a support surface with at least one endless band having upper and lower runs, the upper run of the band extending across the support surface. It is to be understood that the term band is used here in a very general sense and is intended to include a chain, wire, belt or like endless element.

The apparatus preferably also includes a lifting device. This may cause the article to fall over into an inverted position, or if not it at least enables the article to be readily pushed over to its inverted position. This is of considerable advantage when used with mattresses which may weigh seventy pounds or more and which have hitherto had to be inverted by hand.

The apparatus may be so arranged that in use the relative movements of the conveyor and the lifting device are such that the lifting device continues to engage the same part of the mattress or like article throughout the lifting operation. This involves a complex relationship between the movements of the conveyor and lifting device, however, and is not essential. In a preferred arrangement, in fact, the conveyor and lifting device both operate at substantially uniform speeds, and in use the mattress or like article slides over the lifting device so that the part of the mattress or like article engaged by the lifting device when the mattress or like article is almost upright is closer to the middle of the mattress than the part thereof initially engaged by the lifting device. Nevertheless the arrangement is preferably such that the centre of gravity of the mattress always lies between the lifting device and the conveyor.

The invention will now be more particularly described with reference to the accompanying drawings, in which:

FIGURE 1 is a somewhat diagrammatic section through one form of apparatus embodying the invention,

FIGURE 2 is a somewhat diagrammatic section through a second form of apparatus embodying the invention, along the line 2—2 of FIGURE 3, and

FIGURE 3 is a plan view of the apparatus shown in FIGURE 2.

The apparatus shown in FIGURE 1 is intended for use in stitching a mattress or like article and then transferring it to a conveyor. The apparatus comprises a table 10 with legs 11 and a horizontal, rectangular top 12 constituting a support for a mattress 13. A pair of parallel peripheral rails 14 are mounted on the table 10 and are substantially in the same plane as the table top, a sewing machine 8 being supported on the rails and being guided by them and a lower guide rail 9 connected to the legs 11 so that in use it can apply stitching to the periphery of the mattress 13 on the table top 12. The present invention is not concerned with the details of the rails and the sewing machine and they will not therefore be described further. Details of a typical arrangement are, however, given in Patent No. 2,915,027 granted to L. I. Smith and assigned to Slumberland Limited.

A pair of spaced, parallel grooves 15 are formed in the table top only one groove being visible in FIGURE 1. The grooves 15 are parallel with the sides of the table top 12 and symmetrically disposed on either side of the centre-line of the table top. Each groove 15 houses the upper run of an endless chain 16 which extends around a pair of chain-wheels 17 at the ends of the grooves 15, the lower runs passing beneath the table top 12. The two chain-wheels 17 at one end of the table top 12 are mounted on a common horizontal spindle 18, and those at the other end of the table top are mounted on a parallel spindle 19 which is driven from an electric motor 20 disposed beneath the table top. Two upstanding push bars 21 are mounted on the chains 16, the bars being parallel with each other and with the spindles 18 and 19. The bars 21 are so mounted as to slide over the table top 12 when the chain wheels 17 are rotated. The bars 21 are equally spaced so that in an inoperative position such as the position illustrated, both bars 21 are projecting horizontally outwards, one from each pair of chain-wheels 17, just below the level of the guide rails 14. An electric switch (not shown) is provided to cut off the current to the motor 20 as the chains 16 approach their inoperative position so that in normal use the chains stop in their inoperative position automatically after use.

In use the mattress 13 to be stitched is placed on the table top 12 and the sewing machine is operated to perform the stitching operation. As this operation is completed another electric switch (not shown) is operated by the sewing machine to start the electric motor 20 which drives the endless chains 16. The chains 16 then carry one of the bars 21 over the table top 12 and this pushes the mattress 13 in front of it. The bars 21 need be no more than an inch or two high to operate satisfactorily. The arrangement is, of course, such that the sewing machine is not in the path of the mattress 13 as it is pushed off the table and over the guide rails 14. The chains 16 stop when they reach an inoperative position again as described above.

In the arrangement illustrated the mattress 12 on leaving the table 10 tilts onto an inclined guide 22 and slides down it to take up the position indicated by chain-dotted lines 23. The guide 22 is mounted for pivotal movement about its lower edge, and is swung from its inclined position by a pneumatic piston-and-cylinder unit 24 into the upright position indicated in chain-dotted lines 25. The mattress then stands on its edge as indicated in chain-dotted lines 26 on the upper run 27 of a band conveyor, on a conveyor whence can be moved as desired.

The apparatus shown in FIGURES 2 and 3 is somewhat similar to that shown in FIGURE 1 but includes means for use in turning mattresses over during their manufacture. The apparatus comprises a table 30 with legs 31 and a top 32 on which are mounted a pair of rails 33 similar to the rails 14. A sewing machine (not shown) is supported on the rails 33, and in use it operates to sew the top or bottom ticking of a spring-centre mattress to a preformed fabric border. Here again no further details of the rails and sewing machine will be given.

A pair of parallel spindles 34 are rotatably mounted immediately beneath the table top 32 adjacent to, and parallel with opposite side edges thereof. Each spindle 34 carries a pair of spaced pulleys 35 which project through appropriately shaped apertures 36 in the table top. A pair of parallel endless bands 37 extend around the pulleys 35 and the upper runs of the bands, which are at right angles to the spindles 34, slide over the table top 32. The outer surfaces of the bands 37 are transversely ribbed or otherwise formed with an irregular surface to afford good frictional engagement with a mattress 38 placed on the table and overlying the bands. One of the spindles 34 is driven from an electric motor 39 beneath the table.

A slot is formed in the table top between the spindles 34 and parallel with them. The slot is close to the spindle at the discharge end of the conveyor formed by the bands

37 and extends from a location adjacent to one of the bands to a location adjacent to the other. A lifting board 40 whose length is considerably greater than its width is normally housed in the slot, and is connected at its centre to the upper end of the piston rod of a pneumatic piston-and-cylinder unit 41 mounted vertically beneath with table top 32. There is a pivotal connection between the piston rod and the lifting board 40 such as to enable the lifting board to tilt about a horizontal axis 42 parallel to the longer sides of the board.

In use the mattress 38 to be stitched is placed on the table top 34 and overlies the bands 37 and the lifting board 40. When the first stitching operation has been completed the electric motor 39 and pneumatic piston-and-cylinder unit 41 are put into operation. The lifting board 40 raises one end of the mattress 38 while the bands 37 push the other end towards the lifting device. As the mattress 38 moves it slides over the lifting board 40, and the lifting board tilts so as to lie flat against the mattress. Successive positions of the mattress are indicated by the chain-dotted lines 43 and 44 in FIGURE 2. The bands 37 and lifting board 40 continue to move until the mattress 38 is up-ended and rests on its relatively narrow end face as indicated by the chain-dotted lines 45 in FIGURE 2. At this stage the lifting board 40 has tilted through 90° as illustrated by chain-dotted lines 46 and engages the mattress near its centre. The movement of the bands 27 is halted, either automatically or by the action of the operator, and the lifting board 40 is retracted so that it is again flush with the table top 32. The bands 37 are then restarted, and the bottom part of the mattress 38 is carried over the lifting board 40. Due to the inertia of the mattress 38 the upper part of the mattress scarcely moves at all, with the result that the mattress tilts over and falls back onto the top of the table upside down. These movements can be so regulated that the mattress 38 occupies the same position on the table as it did initially, although it is inverted. It will be appreciated that to achieve this turning of the mattress it is only necessary for the lifting device to rise to a height from the table top equal to about half of the length of the conveyor formed by the bands 37.

The second stitching operation is then performed on the mattress 38 and when this has been completed the mattress can be removed by starting the electric motor 39 again and causing the bands 37 to carry the mattress off the table. In doing this the bands operate in a manner similar to the bars 21 in the apparatus shown in FIGURE 1.

I claim:

1. In apparatus for use in the manufacture of mattresses and the like articles, and of the kind comprising a support for the article, guide means extending generally horizontally around the support, a sewing machine movable along the guide means and operative to perform a stitching operation around the periphery of an article on the support, the improvement consisting of the combination of an article conveyor adjacent said support, and adapted to movably engage an article carried on said support, drive means operative to cause the conveyor to move an article on said support in a generally horizontal direction towards one side of the support, and power operated lifting means adjacent to said side of the support and operative to lift one side part of an article on the support while the opposite side part is moved toward said lifting means by the conveyor, whereby the article is up-ended.

2. The combination of claim 1 in which the lifting means comprises a vertically movable carrier, and a head of which the length is considerably greater than the width, the longitudinal axis of the head being horizontal and normal to the direction of movement of the conveyor, and being pivoted to the carrier about an axis parallel with its longitudinal axis so that in use it can tilt as the article being lifted by it is tilted.

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3. The combination of claim 2 in which the conveyor comprises two spaced, parallel, endless bands, each with an upper run and a lower run, the upper runs overlying the support, and the head of the lifting means extending between the upper runs of the bands.

4. The combination of claim 3 in which the head is movable between a lowered position in which it is substantially level with the support and an upper position which is spaced above the lower position by a distance equal to substantially half the length of either of the upper runs of the conveyor.

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