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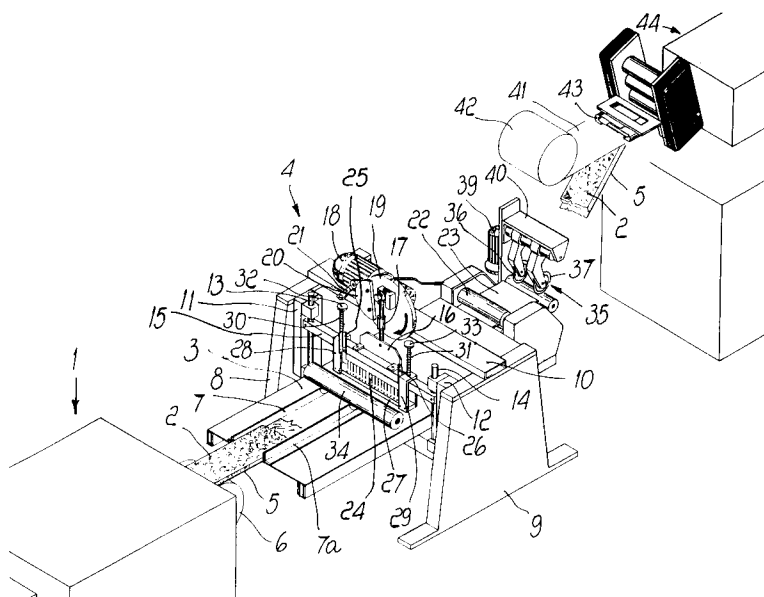
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I-20123 Milano (IT)(54) **Machine for forming padded strips, particularly to be used as perimetric bands in the manufacture of mattresses.**

(57) A machine for forming padded strips, particularly to be used as perimetric bands in the manufacture of mattresses, comprising a machine (1) for dispensing loose material adapted to dispense a continuous layer (2) of loose material and deposit it on a ribbon

(5) that is guided along a horizontal table (3), and means (22,23) for moving the ribbon (5) together with the layer (2) through a needle punch (4) adapted to join the loose material to the ribbon.

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The present invention relates to a machine for forming padded strips, particularly to be used as perimetric bands in the manufacture of mattresses.

It is known that in the manufacture of mattresses perimetric bands are used to join the top and the bottom faces thereof; these bands are constituted by strips of fabric inside which a layer of padding is applied, said layer being constituted by a material having the consistency of foam rubber and appropriately fixed by means of stitching lines that form a zigzag pattern.

However, in the manufacture of mattresses there are considerable amounts of waste material due to production scraps; their disposal is a cause of high costs, also because of the synthetic part of the material.

A principal aim of the present invention is to provide a machine for forming padded strips allowing to recover the waste material produced in the processing of fabrics or similar materials based on natural and synthetic fibers.

Within the scope of this aim, an object of the present invention is to provide a machine that is structurally simple, highly reliable in operation, and versatile in use, as regards both the dimensions of the component to be produced and the type of material being used.

This aim and this object are achieved with a machine for forming padded strips, particularly to be used as perimetric bands in the manufacture of mattresses, characterized in that it comprises a machine for dispensing loose material adapted to dispense a continuous layer of loose material and deposit it on a ribbon guided along a horizontal table, and means for moving said ribbon together with said layer through a needle punch adapted to join said loose material to said ribbon.

Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

the only figure is a perspective view of a machine for forming a perimetric band for mattresses according to the present invention.

With reference to the above figure, the machine comprises a dispensing unit 1 that delivers a continuous layer of loose material composed for example of production scraps such as fabric shreds, natural and synthetic textile fibers, and the like. The dispenser can furthermore be structured so as to ravel out larger scraps or fabrics and mix them with other products such as cotton-wool, fabric scraps, wool, and the like.

The dispenser 1 outputs a continuous layer 2 of loose material that is conveyed onto the receiving table 3 of a needle punch 4 and is deposited

above a ribbon of fabric 5 taken from a feeder spool 6.

On the table 3, the layer 2 and the ribbon 5 are guided by two shoulders 7 and 7a the distance whereof is adjustable according to the required width.

The needle punch 4 is composed of two side walls 8 and 9 rising vertically from a footing and connected at the top by a cross-member 10 arranged so as to form a bridge.

Two respective supports 11 and 12 are fixed on the inner face of the side walls 8 and 9 and support two vertical posts 13 and 14.

The opposite ends of a bar 15 are fixed to the posts 13 and 14, and said bar is centrally provided with a bracket 16 to which an end of a linkage 17 is articulated; said linkage is part of a crank system actuated by a gearmotor 18 mounted on the cross-member 10.

The crank system comprises a disk 19 keyed on the output shaft of the gearmotor 18; the second end of the linkage 17 is articulated eccentrically to said disk. A cam 20 is furthermore fixed to the disk 19; every time the disk 19 turns, said cam operates a switch 21 that controls a motor (not shown in the drawing) for the stepwise advancement of a traction roller 22 that is arranged downstream of the needle punch 4 and cooperates with an underlying belt 23.

The bar 15 supports a comb composed of vertical stitching needles 24 protruding downwardly from the bar 15.

Two L-shaped elements 25 and 26 rise from the bar 15 at the sides of the comb 24 and act as a guide for a presser constituted by a strip 27 provided with holes that are aligned with the needles 24.

The strip 27 has, at its opposite ends, brackets 28 and 29 that are shaped like an inverted U, straddle the bar 15, and are guided by the L-shaped elements 25 and 26 during their movements. The brackets 28 and 29 are actuated downwards by respective springs 30 and 31 inserted on stems 32 and 33 that extend upwards from the bar 15 through slots of the brackets 28 and 29.

At the front, that is to say, upstream of the strip 27, a roller 34 is provided for compacting the layer 2 of loose material, and downstream of the traction roller 23 a cutting unit 35 is provided for trimming the side edges of the strip (loose material and ribbon) at the output of the needle punch 4.

The cutting unit 35 is composed of two circular blades 36 and 37 that are in tangent contact with a roller 38 driven by an electric motor 39. The blades 36 and 37 and the roller 38 are mounted on a support 40, so that their contact plane is substantially co-planar with respect to the belt 23.

The operation of the machine according to the invention is fully evident from the description that

has been given.

The strip composed of the layer 2 and of the ribbon 5 is compressed by passing under the roller 34 and is then compacted by the stitches formed by the needles 24 that join the layer 2 to the ribbon 5.

It should be noted that every time the comb of needles 24 lowers, the traction roller 22, actuated by the cam 20, stops and then continues as soon as the needles have risen into the position in which they are disengaged from the strip.

The strip thus stitched is trimmed along its longitudinal edges by the circular blades 37 and 38 to the desired width.

The described machine is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

In particular, it is possible to cover the strip at the output of the needle punch, or of the cutting unit, with an additional ribbon 41 taken from an additional spool 42. By means of an appropriate guide 43, the side borders of the ribbon 41 are tucked under the borders of the underlying ribbon 5, so as to obtain a "sandwich" band in which the layer 2 of loose material is interposed between the ribbons 5 and 41. The band thus obtained is then introduced in an embroidering machine 44 that joins the ribbon 41 to the underlying layer by forming stitching lines having a zigzag or fret-like pattern.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. Machine for forming padded strips, particularly to be used as perimetric bands in the manufacture of mattresses, characterized in that it comprises a machine (1) for dispensing loose material adapted to dispense a continuous layer (2) of loose material and deposit it on a ribbon (5) that is guided along a horizontal table (3), and means (22, 23) for moving said ribbon (5) together with said layer (2) through a needle punch (4) adapted to join said loose material to said ribbon.
2. Machine according to claim 1, characterized in that said needle punch (4) comprises a bar (15) that moves vertically in a reciprocating manner, a comb of needles (24) that are rigidly coupled to said bar (15), and a presser (27)

that is guided on said bar (15) and is adapted to compress said layer (2) of loose material on said ribbon (5).

3. Machine according to claim 2, characterized in that said presser is constituted by a strip (27), provided with holes that are aligned with said needles (24) and provided, at the opposite ends, with brackets (28, 29) that are shaped like an inverted U and straddle said bar (15), said strip (27) being actuated downward by springs (30, 31) that abut against stems (32, 33) rigidly coupled to said bar (15).
4. Machine according to one of the preceding claims, characterized in that upstream of said presser (27) a roller (34) is provided for compacting the layer (2) of loose material.
5. Machine according to one of the preceding claims, characterized in that said traction means comprise a roller (22) actuated with a stepwise motion that is synchronized with the reciprocating motion of the needles (24) of the needle punch (4).
6. Machine according to one of the preceding claims, characterized in that downstream of said traction roller (22) a cutting unit (35) is provided, adapted to trim the lateral borders of the strip.
7. Machine according to claim 6, characterized in that means for feeding an additional ribbon (41) for covering said strip (2, 5) are provided downstream of the cutting unit (35), and in that a guide (43), adapted to tuck the borders of said additional ribbon (41) around the edges of said strip (2, 5), and a sewing (quilting) machine (44), for joining said additional ribbon (41) to said strip (2, 5) with stitching lines and form a "sandwich" band, are furthermore provided.

