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Method and apparatus for the manufacture of labels

The invention relates to a method for the manufacture of labels in a broad weave produced in a meltable thread material using weaving technology with a ground fabric and a plurality of embroidery wefts for the figure, with the broad weave being parted after weaving by means of first cutting devices, while forming a first cut edge extending in the warp direction, into a group of bands lying alongside one another, with a supply reel being produced for each band.

In EP-A-0 389 793 a method is described for the manufacture of labels which are woven in a broad weave 1 of a meltable yarns, with the fabric consisting of a ground fabric and embroidery wefts guided over the entire width of the web, which form the figure 2 of the label, with the fabric having a plurality of strips 3 with figures 2 which are aligned in the warp direction. Directly after weaving, the textile web is cut at the loom into bands 4 extending in the warp direction while forming a first cut edge 5. Thereafter, these cut edges 5 are folded, because they have fringes, either in separate devices or directly at the loom, are set by heat treatment and are drawn off as a band 6 of labels. The bands are later cut in a separate process while forming a second cut edge 7, so that pre-products arise which are folded at the longitudinal sides 8. These pre-products are folded at the second cut edges 7 which extend transversely to the first cut edges 5, so that labels 10 ready for use arise which are folded at the longitudinal sides 8 and at the transverse sides 9 which are packed into a container 11 as is shown in Fig. 1.

This method has essentially the disadvantages that the apparatuses which are required for the manufacture of the labels are integrated into the weaving machine, so that the handling is made more difficult, that the

weaving machine has to be stopped if the devices are faulty or the devices have to be stopped if the weaving machine is faulty, so that the productivity is reduced, that the smoke or the vapours which develop in manufacture are liberated unhindered, so that the working conditions in the area of the weaving machine are impaired, and that the so folded labels have a fold at all edges, i.e. at all four edges, whereby these appear rigid, thick and awkward to handle.

The invention is based on the object of improving a method for the manufacture of labels.

This object is satisfied in accordance with the invention by the features of the claims 1 and 2.

The advantages of the invention are to be seen in the automation of the manufacture, of the simplified operation following from this, in the favourably priced manufacture of the labels, but also in the improved working conditions and also in the improved and refined edge quality of the so manufactured labels. Since the figure of the labels and the second cut edge 19 is aligned in the weft direction, the band is only folded along the first cut edges and cut through the ground fabric, so that labels ready for use arise. In this way, the method, and thus the apparatus, is simplified in an advantageous manner.

An apparatus for carrying out the method is characterised in accordance with the invention by the features of the claims 10 and 11.

The invention will explained with reference to the accompanying drawings.

There are shown:

- Fig. 1 a schematic representation of a method for the manufacture of labels known from EP 0 389 793;
- Fig. 2 a schematic representation of an embodiment of a method in accordance with the invention for the manufacture of labels;
- Fig. 3 a schematically illustrated first embodiment of an apparatus for the manufacture of labels;
- Fig. 4 a schematically illustrated second embodiment of an apparatus for the manufacture of labels;
- Fig. 5 a schematically illustrated third embodiment of an apparatus for the manufacture of labels;
- Fig. 6 a schematically illustrated fourth embodiment of an apparatus for the manufacture of labels;
- Fig. 7 a view of an apparatus for the folding of a band with labels;
- Fig. 8 a view in the direction of the arrow A in Fig. 7;
- Fig. 9 a section along the line VI;-VII in Fig. 7;
- Fig. 10 a section along the line VIII-VIII in Fig. 7;
- Fig. 11 a section along the line IX-IX in Fig. 7;

- Fig. 12 a schematic representation of an embodiment of a second cutting apparatus;
- Fig. 13 a schematic illustration of another embodiment of a second cutting apparatus;
- Fig. 14 a schematic illustration of an embodiment of an apparatus for the controlling and alignment of the band with labels, and
- Fig. 15 a view in the direction of the arrow A in Fig. 12.

For the manufacture of the labels a broad weave 11 is woven which comprises a ground fabric and embroidery wefts led over the full web width which form the figure 12, with the fabric having a plurality of strips 13 with figures 12, which are aligned in the weft direction. Directly after the weaving the textile web is cut at the weaving machine into the bands 14 extending in the warp direction while forming a first cut edge 15. The bands are each wound onto a supply reel 16.

As Fig. 2 shows, in the method under discussion here, the band 14 is drawn off from the supply reel 16, because the first cut edges 15 have fringes the band 14 is subsequently folded along the first cut edges 15 and subsequently cut while forming a second cut edge 17, so that labels 18 ready for use are produced with unfolded longitudinal sides 19 and folded narrow sides 20 and are packed into a container 21. Further embodiments of the method will be described in the following description in connection with the embodiments of apparatuses in accordance with the invention. It is pointed out that unfolded labels and labels with a central fold can be produced with the above described method and the subsequently described apparatuses while circumventing the folding process.

The apparatus of Fig. 3 consists essentially of a mount 31 for the supply reel 16, an apparatus 32 for the chemical finishing and a first embodiment of a cutting apparatus 33 which are arranged online in a non-illustrated frame, i.e. forming a continuous production line. An apparatus 34 for the alignment and checking of the labels is provided with advantage.

The band 14 having the first cut edges 15 is drawn off from the supply reel 16 by means of a non-illustrated draw-off unit, is guided over a deflection reel 37, is drawn through the apparatus 34 in order to check the figure 12 and to align the band 14 for the cutting, is conveyed through the apparatus 32 for the chemical finishing and introduced into the cutting apparatus 33 in which the labels 18 are cut off from the band 14 while forming the second cut edge 19 and are subsequently packed into the container 21. It is pointed out that the apparatus 34 for the alignment and checking of the labels can be arranged directly before the cutting apparatus 33.

The apparatus of Fig. 4 comprises, online, the mount 31 for the supply reel 16, a roller arrangement 41 for the guidance of the band 14, the apparatus 34 for the checking of the figure 12 and for the alignment of the band 14, an apparatus 42 for the folding of the band 14, an apparatus 43 for the setting of the folds, a band conveyor 44, a second embodiment of a cutting apparatus 45 which cuts off the label 18 from the folded band while forming the second cut edge 19 and packs the labels 18 into a container 21.

The apparatus 43 for the setting contains a pressure roller 46 standing under spring action and a counter-roll 47, with a heating element 48

being provided with advantage. Furthermore, a deflection roller 49 is provided for the folded band.

The apparatus shown in Fig. 5 contains, online, a mount 31 for the supply reel 16, a deflection roller 37 for the band 14, a first apparatus 34 for the checking of the figure 12 and for the alignment of the band 14, an apparatus 42 for the folding of the band 14, a second apparatus 34 for the checking of the figure 12 and for the alignment of the folded band, an apparatus 51 for the setting of the folds, an apparatus 52 for the drying and heat setting of the folded band, a first embodiment of an apparatus 33 for the cutting of the folded band and for the packing of the labels 18 ready for use into a container 21.

In this apparatus the apparatus 51 for the setting and chemical finishing of the folds contains, in addition to the pressure roller 46 standing under spring action and the counter-roller 47 as well as the heating element 48, a chemical finishing bath 54 with a deflection roller 55 in order to direct the folded band through the finishing bath.

The band 14 is drawn off from the supply reel 16 by means of a non-illustrated draw-off device, which is arranged with advantage online before the cutting apparatus 33, is guided over the deflection roller 37 and is conveyed through the above mentioned apparatuses 34, 42, 51, 34, 52 arranged online and into the cutting apparatus 33.

The apparatus shown in Fig. 6 has, online, a mount 31 for the supply reel 16, a roller arrangement 41 for the band 14, an apparatus 34 for the checking of the figure 12 and for the alignment of the band 14, an apparatus 42 for the folding of the band 14, an apparatus 43 for the setting of the folds, an apparatus 52 for the chemical finishing of the folded band, a

draw-off apparatus 62 for the folded band, an apparatus 63 for the drying of the folded band, an apparatus 64 for the heat setting of the folded band and a second embodiment of a cutting apparatus 45 which cuts off the label 18 from the folded band while forming the second cut edge 19 and packs the labels 18 into a container 21. In this apparatus the folding apparatus and the apparatus for the setting of the folds are combined into a first module 65 and the apparatus for the chemical finishing, the draw-off apparatus, the apparatus for the drying of the folded band and the apparatus for the heat setting of the folded band are combined into a second module 66.

Reference is made to the Figs. 7 and 11 which show an embodiment of the folding apparatus 32 with integrated apparatus 71 for the setting of the folds. As Fig. 7 shows, the band 14 is led out of the apparatus 34 for the checking of the figure 12 and for the alignment of the band to the folding apparatus 42. The apparatus for the setting (fixing) of the folds comprises an electrical heating element 72 and rollers 73 and 74 which direct the folded band under tension over the setting apparatus 71. The roller 73, 74 can be associated with the folding apparatus or separately arranged. As Fig. 8 shows, the folding apparatus has an elongate tapering form which is so designed that the band 14 can be freely introduced at the broader end 75 and emerges at the narrow end 76 as a band folded to the length of the label.

As Figs. 9 to 11 show, the folding apparatus contains a folding plate 81 and a support plate 82. The folding plate 81 is provided at the longitudinal sides with an edge portion 83. The contour of the support plate is so designed that the support plate is arranged at the lower side of the folding plate and within the edge portion, with a spacing being provided in each case between the oppositely disposed surfaces in order to supply the band

14 with the figures 12. A support section 84 for the folded band is formed at the narrow side of the folding plate. The heating element 72 is so secured to the lower side of the support section that the support section is heated and thus forms the apparatus for the setting of the folds formed at the band. The design of the edge portion is shown in Figs. 7 to 9 and will not be described in more detail.

The band 14 is drawn through the folding apparatus, with the edge regions being turned over in accordance with the design of the edge portions 83. After the folding, the band is drawn over the heated support section with the folds being set.

The Fig. 12 shows an embodiment of a second cutting apparatus with an integrated packing apparatus. The cutting apparatus contains a pair of measurement rollers 90 which is connected to the non-illustrated control apparatus, a guide apparatus 91 with an upper part 92 and a lower part 93 in order to guide the folded band, a cutting member 94 which is moved to and fro by a drive 95 and cooperates with the lower part in order to cut the band along the second cut edge and a guide part 96 for the cutting member. The cutting member 94 can be provided with a heating element 97.

In this cutting apparatus the folded band is supplied via the measurement rollers 90, with the measurement rollers interrupting the supply of the band after the passage of a predetermined band length which corresponds to the length of the label. After the cutting off of the label, the supply is released again.

The Fig. 13 shows an apparatus which consists essentially of measuring rollers 90, which are connected to a non-illustrated control device, a

thermal or ultrasonic cutting apparatus 101, a guide apparatus 102 for the band and a packing apparatus 103. The cutting apparatus is known and is installed at a fixed location. The guide apparatus 102 contains a lower part 104 installed at a fixed location and an upper part 105 which can be displaced relative to the lower part 104. A cutting edge is formed on the upper part at the outlet side of the band and a rounded portion is formed at the entry side of the band. The packing apparatus 103 contains a plunger 107 which cooperates with the cut edge at the upper part, a drive 108 and a guide 109 for the plunger which has a formation for the mounting of the container 21.

In this apparatus the folded band is supplied via the measurement rollers 90, with the measurement rollers interrupting the supply of the band after the passage of a band length preset in the control apparatus which corresponds to the length of the label, so that labels with the same length are cut.

The Figs. 14 and 15 show an embodiment of an apparatus for the checking of the figure 12 of the label and for the alignment of the band. The apparatus contains a unit 111 for the sensing of the position of the figure 12 of the label, two first roller pairs 112 and a second roller pair 113 which each comprise a drive roller 115 and a counter-roller 116 as well as stepping motors 117 which are connected to the drive roller. The sensing apparatus and the stepping motors are connected in signal-transmitting manner to a non-shown control apparatus.

In this apparatus faulty figures 12 of the label are, on the one hand, detected by means of the unit 111 and, on the other hand, the position of the label on the folded band is sensed. With faulty figure 12, the corresponding label is separated out after the cutting. With correct figure 12

and correct position of the label, the band is conveyed by means of synchronously rotating first and second conveying rollers to the cutting apparatus. If deviations from the correct position arise, then, depending on the nature of the deviation, the first conveying rollers are driven with different speeds of rotation and thus the position of the label is aligned and centred.

Patent Claims

1. Method for the manufacture of labels in a broad weave produced in a meltable thread material using weaving technology with a ground fabric and a plurality of embroidery wefts for the figure, with the broad weave being parted after weaving by means of first cutting devices, while forming a first cut edge extending in the warp direction, into a group of bands lying alongside one another, with a supply reel being produced for each band and wherein – online - the band is drawn off from the supply reel, is chemically finished and is cut by means of a second cutting apparatus in the ground fabric while forming a second cut edge such that labels ready for use are produced.
2. Method for the manufacture of labels in a broad weave produced in a meltable thread material using weaving technology with a ground fabric and a plurality of embroidery wefts for the figure, with the broad weave (11) having a plurality of strips (13) with figures (12) and being parted after the weaving by means of first cutting devices, while forming a first cut edge (15) extending in the warp direction, into a group of bands (14) lying alongside one another and containing at least one strip and with the bands being wound up, wherein strips of figures, which are aligned in the weft direction are woven into the broad weave and wherein – online - the band is drawn off from a supply reel, the band is folded along the first cutting edge and is cut by means of a second cutting apparatus in the ground fabric while forming a second cut edge (17) extending in the weft direction such that the labels which are ready to use are produced with figure aligned parallel to the second cut edge, i.e. to the weft threads.

3. Method in accordance with claim 1 or claim 2, characterised in that band is set by means of heat treatment prior to the cutting.
4. Method in accordance with claim 1 or claim 2, characterised in that the band is checked and aligned precisely for cutting before the cutting.
5. Method in accordance with one of the preceding claims, characterised in that the band is cut mechanically, thermally, or with ultrasound.
6. Method in accordance with one of the preceding claims, characterised in that the band is folded at the first cut edges.
7. Method in accordance with one of the preceding claims, characterised in that the band is folded parallel to the first cut edges at the centre.
8. Method in accordance with one of the preceding claims, characterised in that the band is folded before the chemical finishing and/or before the setting.
9. Method in accordance with one of the preceding claims, characterised in that the folds are and set before the chemical finishing.
10. Method in accordance with one of the preceding claims, characterised in that the folds are set by means of heat and/or pressure.

11. Apparatus for carrying out the method in accordance with one of the preceding claims, containing – online - an apparatus (31) for the rotationally movable reception of at least one supply reel (16), with the band having the labels, an apparatus (32) for the chemical finishing of the band and an apparatus (33, 45) for the cutting of the band to produce labels ready for use.
12. Apparatus in accordance with claim 11, which contains - online - an apparatus (42) for the folding of the band.
13. Apparatus in accordance with claim 11, which contains online an apparatus (52, 64) for the heat setting.
14. Apparatus in accordance with claim 12 in which the apparatus (42) for the folding is positioned before the apparatus (32, 52) for the chemical finishing and/or the apparatus (64) for the heat setting.
15. Apparatus in accordance with claim 11 and 13 in which the apparatus (63) for the drying is positioned after the apparatus (52) for the chemical finishing and before the apparatus (45) for the cutting.
16. Apparatus in accordance with claim 12 in which the apparatus (42) for the folding is positioned after the apparatus (32) for the chemical finishing and/or the apparatus (64) for the heat setting.
17. Apparatus in accordance with claim 11 or 13 in which the apparatus (42) for the folding has an elongate, tapering shape such that the band (14) can be freely inserted at the broader end (75) and the band folded to label length emerges at the narrow end (76).

18. Apparatus in accordance with claim 11 or 12 which contains - online - an apparatus (43, 51) for the setting of the folds, which is arranged downstream of the apparatus (42) for the folding.
19. Apparatus in accordance with claim 13 in which the apparatus (43, 51) for the setting is integrated into the apparatus (42) for the folding.
20. Apparatus in accordance with claim 15 in which the apparatus for the setting has a heating element (48).
21. Apparatus in accordance with claim 17 in which the apparatus (43, 51) for the setting has a pressure roller, with the pressure roller being heatable.
22. Apparatus in accordance with claim 11 which contains a mechanical, a thermal, or an ultrasonic cutting apparatus.
23. Apparatus in accordance with one of the claims 11 to 22 which contains online an apparatus for the packaging of the labels (18) ready to use which is arranged online after the cutting apparatus (45).
24. Apparatus in accordance with one of the claims 11 to 23 which has an apparatus (33) for the cutting of the band and for the pre-packing of the labels (18) ready for use.
25. Apparatus in accordance with claim 11, one of the claims 11 to 24, which contains online an apparatus (34) for the alignment and checking of the band.

26. Apparatus in accordance with claim 25 in which the apparatus (34) is positioned directly before the cutting apparatus (33) for the alignment and checking.