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(54) A sliver guide for combing machines

(57) The guide plate (5) for slivers (4) described is associated with an oscillating nipper (2) in a combing machine in order to guide a sliver (4) to be combed which is advancing towards a feed roll (6) of the oscillating nipper (2). To ensure that the sliver is supplied smoothly, quickly and without stoppages, the guide plate (5) is of a substantially right-angled shape and has a first portion (7) which receives the sliver (4) from a fixed feed unit (3, 20), a second portion (8) which supplies the sliver (4) to the feed roll (6) close to which it is articulated to the Ripper (2), and a rounded, bent intermediate portion (9) which is connected rigidly to the second portion (8) and has a convex part (10) over which the sliver (4) slides. Moreover, the plate (5) is restrained on the frame of the machine by means of a connecting rod (30).

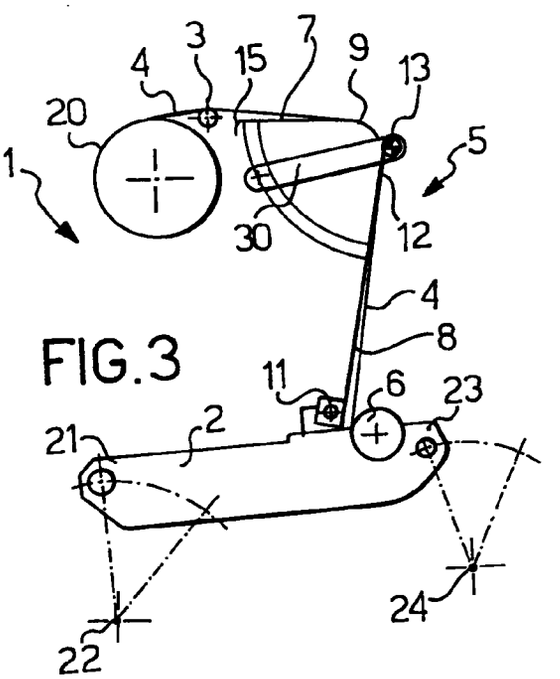


FIG.3

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Description

The present invention relates to a guide plate for slivers as defined in the preamble of appended Claim 1.

In feed devices for combing machines, the web of textile fibres to be combed, or the sliver, as it is conventionally called, is unrolled from a reel by means of rotating grooved rollers and extends across the guide plate as far as the oscillating nipper structure which comprises a feed roll and from which the sliver passes to the actual combing machine.

As it passes from the grooved rollers to the feed roll, the sliver must always be kept under slight tension. This requirement is hampered, however, by the fact that, in order to carry out the combing operation, together with the detaching rollers and with the rotary comb of the combing machine, the nipper structure performs an oscillatory movement. As a result, the length of the path which the sliver has to follow varies continuously between a minimum value and a maximum value.

For the supply system to operate well, the advance of the sliver must be as smooth and uniform as possible, irrespective of the aforementioned oscillatory motion which, however, tends to cause stoppages and breakage of the sliver because of insufficient or excessive tension.

As described in the publication EP 0409775, it has been proposed to form the guide plate as a single piece of plastics material connected, on the one hand, to the oscillating nipper structure and, on the other hand, to the frame of the machine close to the unrolling roller of the sliver feed unit. The plate has a reduced thickness along a bend line perpendicular to the direction of sliding of the sliver so that, in practice, it is constituted by two portions which move relative to one another as if they were joined by a hinge. This solution has been found to be quite critical with regard to the selection of the material and is not always satisfactory with regard to the uniformity of the tensioning of the sliver.

The object of the present invention is to provide a guide plate for slivers which enables the tension of the sliver to be kept uniform and is of simple and reliable construction.

This object is achieved by the provision of a guide plate for slivers as defined and characterized in Claim 1.

Further characteristics, as well as the advantages of the guide plate according to the invention will become clear from the description of two preferred embodiments given by way of non-limiting example, with reference to the appended drawings, in which:

Figures 1 and 2 are a schematic side view of a feed device for combing machines which incorporates a guide plate for slivers according to the invention, in two different stages of operation,

Figures 3 and 4 are schematic side views of a device similar to that of Figures 1 and 2 in two different stages of operation, the device incorporating a different version of the guide plate for slivers according to the invention, and

Figure 5 shows a detail of a variant of the system for connecting the sliver guide-plate according to the invention to the frame of the machine.

In the drawings, a sliver feed device, generally indicated 1, is associated with an oscillating Ripper structure 2 in a combing machine, not shown.

In Figures 1 and 2, the device 1 comprises a feed unit with a grooved roller 3 which rotates so as to unroll from a reel 20 a sliver 4 to be combed.

The grooved roller 3 rotates about an axis which is fixed relative to the frame of the device 1, not shown, which in turn is fixed to the frame of the machine.

The device 1 also comprises a guide plate 5 which is associated with the nipper structure 2 and is arranged to guide the sliver 4 to be combed, which is advancing towards a feed roller 6 of the oscillating nipper structure 2.

The guide plate 5 is substantially right-angled in shape and comprises a first, substantially quadrangular portion which is arranged horizontally and receives, on its upper face, the sliver from the grooved roller 3.

In the present embodiment, the first portion 7 is fixed to the frame of the feed device 1 and is constituted by a metal plate made of stainless steel, advantageously rendered smooth by polishing on its upper face.

The guide plate 5 also comprises a second portion 8 which is also substantially quadrangular, is arranged in a transverse position relative to the first portion 7, and supplies the sliver to the feed roller 6 of the nipper structure 2.

The plate 5 also comprises a rounded, bent portion 9 disposed in an intermediate position relative to the first and second portions 7, 8, to complete the right-angled shape. It has a convex part 10 over which the sliver 4 slides before passing over the second portion 8.

The second portion 8 has a lower end 11 by which it is articulated to the oscillating Ripper structure 2, close to the feed roller 6.

Opposite the lower end 11, the second portion 8 also has an upper end 12 by which it is rigidly connected to the bent portion 9, defining therewith a curved sliding surface for the sliver, the second portion 8 being movable and guided by guide means fixed to the frame.

In this embodiment, the bent portion 9 and the second portion 8 are formed in a single piece by a single, suitably-bent metal plate, preferably made of stainless steel and advantageously polished on the bent sliding surface.

The guide means comprise at least one connecting rod. In this embodiment, there are two identical connecting rods, of which only one, indicated 30, is visible in the drawings, and which are fixed for pivoting on the frame of the machine at one end and on the two oppo-

site sides of the portion 8, at the same distance from the axis of articulation to the Ripper structure 2, at the opposite end. The position in which the connecting rods 30 are connected along the sides of the portion 8, that is, the position of the axis of rotation 13, is selected so as to take account of the movement of the Ripper structure 2 so that the path of the sliver 4 between the grooved roller 3 and the feed roll 6 is substantially constant during the operation of the machine.

As is known, the oscillating nipper structure performs a complex oscillatory motion since one end 21 thereof is restrained on the frame so as to describe an arc about a first point 22 on the frame and its opposite end 23 is restrained so as to describe an arc about a second point 24 on the frame. As a result of the connections described above, the plate 5 has one end, the lower end 11 of the second portion 8, which follows the motion of the nipper structure 2.

It can be seen that the intermediate bending point on the portion 9 where the sliver changes direction is always at a substantially constant distance from the feed roll 6 (Figure 1, compared with Figure 2) during the movement of the nipper structure 2.

Similarly, the distance between the bent portion 9 and the grooved roller 3 remains substantially constant, even though the portion 9 has a free end 14 which describes an arc in space. Owing to the bending, this free end does not interfere with the motion of the sliver 4 which rises and falls, accompanied by the end 14, whilst the first portion 7 helps to guide it.

A second embodiment of the guide plate according to the invention is described below with reference to Figures 3 and 4 with the use of the same reference numerals for identical or equivalent parts.

In this embodiment the device 1 again comprises a feed unit with a grooved roller 3 which rotates so as to unroll from a reel 20 a sliver 4 to be combed.

The grooved roller 3 rotates about an axis which is fixed relative to a frame of the device 1, not shown, which in turn is fixed to the frame of the machine.

The device 1 also comprises a guide plate 5 which is associated with the Ripper structure 2 and is arranged to guide the sliver 4 to be combed which is advancing towards a feed roller 6 of the oscillating Ripper structure 2.

The guide plate 5 is of a substantially right-angled shape and comprises a first, substantially quadrangular portion 7 which is arranged horizontally, receives the sliver from the grooved roller 3, and, advantageously, is polished on its upper face to facilitate the passage of the sliver 4.

The guide plate 5 also comprises a second portion 8 which is also substantially quadrangular, is arranged in a position substantially perpendicular to the first portion 7, and supplies the sliver to the feed roll 6 of the nipper structure 2.

The plate 5 also comprises a rounded, bent portion 9 which is in an intermediate position relative to the first and second portions 7, 8 to complete the right-angled shape. It has a convex part 10 over which the sliver 4 slides before passing over the second portion 8.

The second portion 8 has a lower end 11 by which it is articulated to the oscillating nipper structure 2 close to the supply roll 6.

The second portion 8 also has an upper end 12 by which it is connected rigidly to the bent portion 9. The first portion 7 is also connected rigidly to the bent portion 9 on the opposite side.

In comparison with the previously-described embodiment, the portion 9 and the second portion 8 define for the sliver a curved sliding surface which also comprises the first portion 7.

The first portion 7, the bent portion 9 and the second portion 8 are preferably formed in one piece by a suitably-bent metal plate made of stainless steel, advantageously polished on the curved sliding surface.

The bent portion 9 and hence the entire plate 5 is restrained on the frame of the machine by means of at least one connecting rod. In this embodiment again, there are two identical rods 30 fixed pivotably to the two opposite sides of the portion 8 at the same distance from the axis of articulation to the Ripper structure 2. The position in which the connecting rods 30 are fixed is selected by the same criterion as in the embodiment described with reference to Figures 1 and 2.

In this embodiment, the intermediate bending point on the portion 9 where the sliver changes direction is also always at a substantially constant distance from the feed roller 6 (Figure 3 compared with Figure 4) during the movement of the nipper structure 2.

Similarly, the distance between the bent portion 9 and the grooved roller 3 remains substantially constant, even though the first portion 7 has a free end 15 which describes an arc in space.

Owing to the bending, the free end 15 does not interfere with the movement of the sliver 4 which rises and falls alternately in operation whilst the first portion 7 helps to guide the sliver 4.

Preferably, in this embodiment of the guide plate 5, described with reference to Figures 3 and 4, an angle of no less than 70° and no more than 90° is included between the first portion 7 and the second portion 8.

According to the variant shown in Figure 5, the guide means of the portion 8 of the plate 5 are constituted by two pins 13' (only one of which is visible in the drawing) which are fixed laterally to the upper end of the portion 8, and by two slots 50 formed in respective plates 51 fixed to the frame and defining a track for the pins 13'. The slots 50 may define a straight track, as shown in the drawing, or may be shaped so as to define an arcuate track. To enable the guide means to be adjusted to the best position, suitable means, of known type, not shown, may be provided for fixing the plates 51 to the frame in an adjustable manner.

In addition to the advantages mentioned above, the guide plate according to the invention is structurally sim-

ple, is easy to fit and maintain and can be produced at low cost. Moreover, it is substantially immune to wear since it does not have parts which are subject to deformation or bending in operation.

In order to satisfy further and contingent requirements, an expert in the art may apply to the guide plate for slivers according to the invention many further modifications and variations all of which, however, are included within the scope of protection of the present invention defined by the appended claims.

Claims

1. A guide plate (5) for slivers (4) which is associated with an oscillating Ripper structure (2) in a combing machine in order to guide a sliver (4) to be combed which is advancing towards a feed roll (6) of the oscillating nipper structure (2), the guide plate (5) being of a substantially right-angled shape having a first portion (7) which receives the sliver (4) from a feed unit (3, 20) fixed to the frame of the machine, a second portion (8) which supplies the sliver (4) to the feed roll (6), and a rounded, bent, intermediate portion (9) with a convex part (10) over which the sliver (4) slides, characterized in that the second portion (8) is connected rigidly at one end (12) to the rounded bent portion (9), defining therewith a curved sliding surface guided movably by guide means fixed to the frame and, at an opposite end (11), is articulated to the oscillating Ripper structure (2) close to the feed roll (6).

2. A guide plate (5) for slivers (4) according to Claim 1, in which the guide means comprise at least one connecting rod (30).

3. A guide plate (6) for slivers (4) according to Claim 1, in which the guide means comprise at least one pin (13') guided along a track (50).

4. A guide plate (6) for slivers (4) according to Claim 3, in which the pin (13') is fixed to the second portion (8) and the track is defined by a slot (50) formed in a plate (51) fixed to the frame.

5. A guide plate according to Claim 4, in which the plate (51) is fixed to the frame in an adjustable manner.

6. A guide plate (5) for slivers (4) according to any one of the preceding claims, in which the first portion (7) is connected rigidly to the rounded, bent portion (9), the curved sliding surface also comprising the first portion (7).

7. A guide plate for slivers (4) according to Claim 6, in which an angle of between 70° and 90° is included between the first and second portions (7, 8).

8. A guide plate (5) for slivers (4) according to Claim 6 or Claim 7, in which the first portion (7), the rounded, bent portion (9), and the second portion (8) are formed in one piece by a single, suitably-bent metal plate.

9. A guide plate (5) for slivers (4) according to Claim 8, in which the metal plate is made of stainless steel.

10. A guide plate (5) for slivers (4) according to any one of Claims 1 to 5, in which the first portion (7) is fixed to the frame.

11. A guide plate (5) for slivers (4) according to Claim 10, in which the rounded, bent portion (9) and the second portion (8) are formed integrally by a single suitably-bent metal plate.

12. A guide plate (5) for slivers (4) according to Claim 11, in which the metal plate is made of stainless steel.

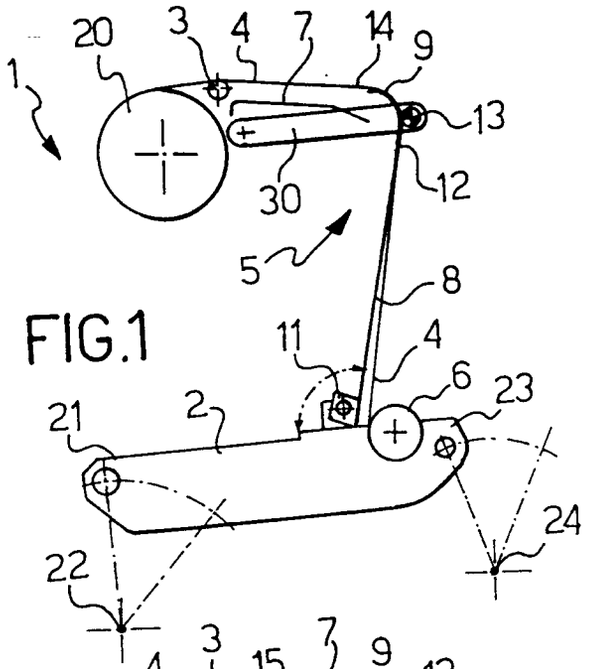


FIG.1

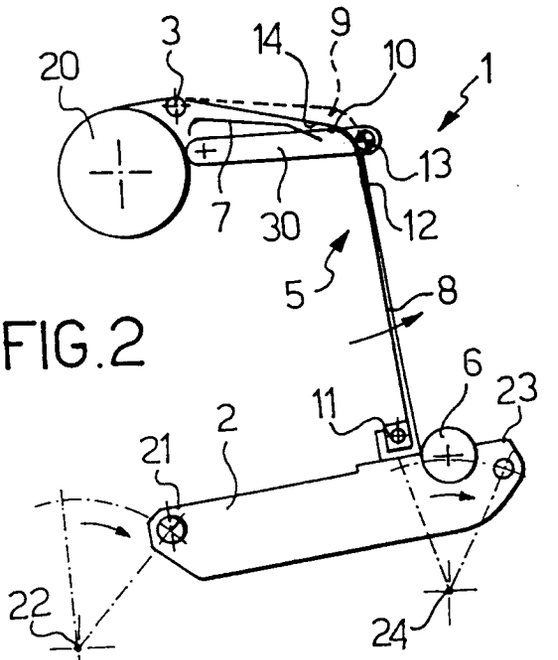


FIG.2

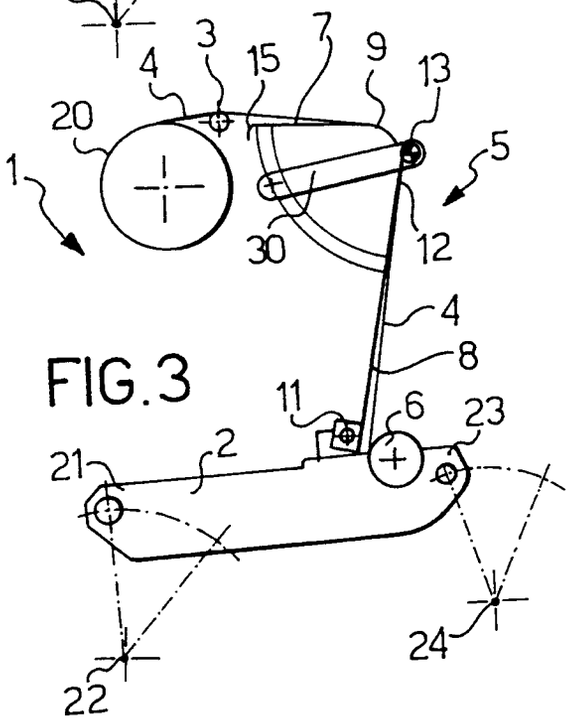


FIG.3

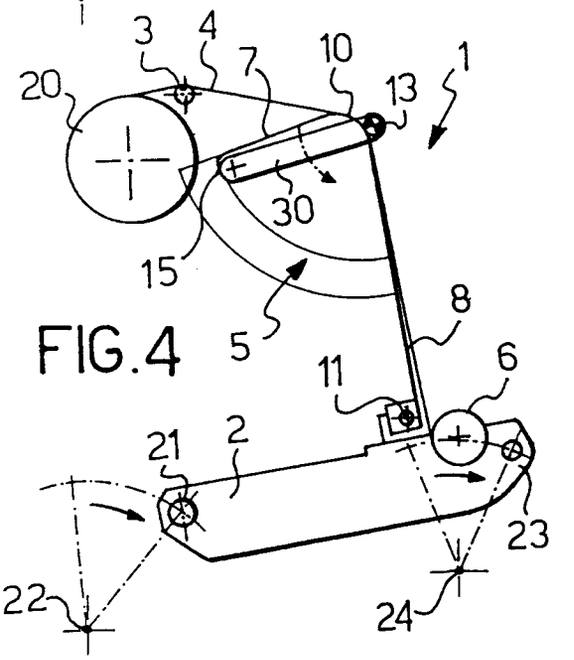


FIG.4

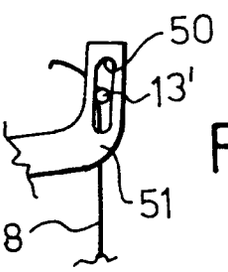


FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 97 20 2348

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	EP 0 437 807 A (MASCHINENFABRIK RIETER A.G.) 24 July 1991 * column 5, line 30 - column 6, line 36; claim 1; figures 1-5 *	1,2	D01G19/08
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A		3,4,8	
A	US 3 320 643 A (MUTSUHIKO KATORI) 23 May 1967 * column 3, line 44 - column 4, line 63; claim 1; figure 10 *	1	
A	US 2 559 074 A (HINSON,O.C.) 3 July 1951 * column 6, line 27 - column 7, line 39; claim 1; figure 3 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6) D01G
A	FR 1 293 005 A (SACM) 5 October 1962 * page 2; figures 2,3 *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 July 1998	Munzer, E

CATEGORY OF CITED DOCUMENTS

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