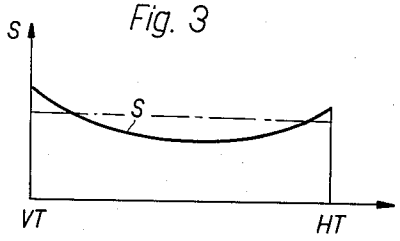
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SUPPLYING LAP TO THE NIPPERS OF COMBING MACHINES

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Fig. 3



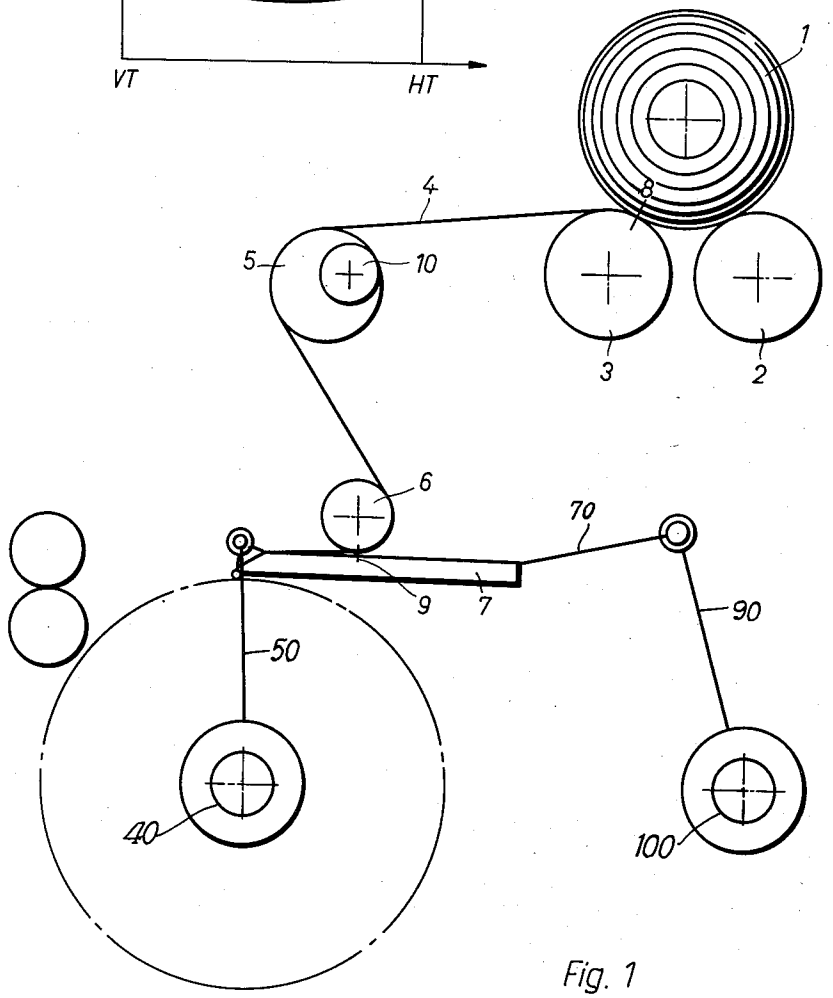


Fig. 1

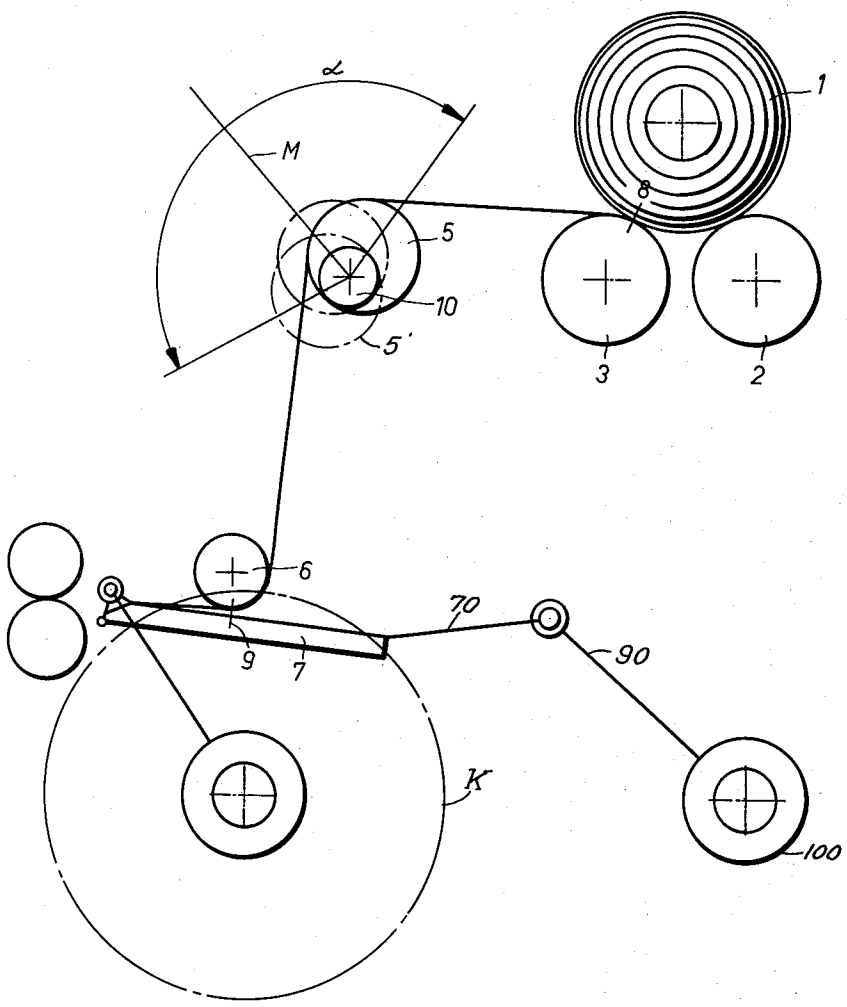
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Fig. 2



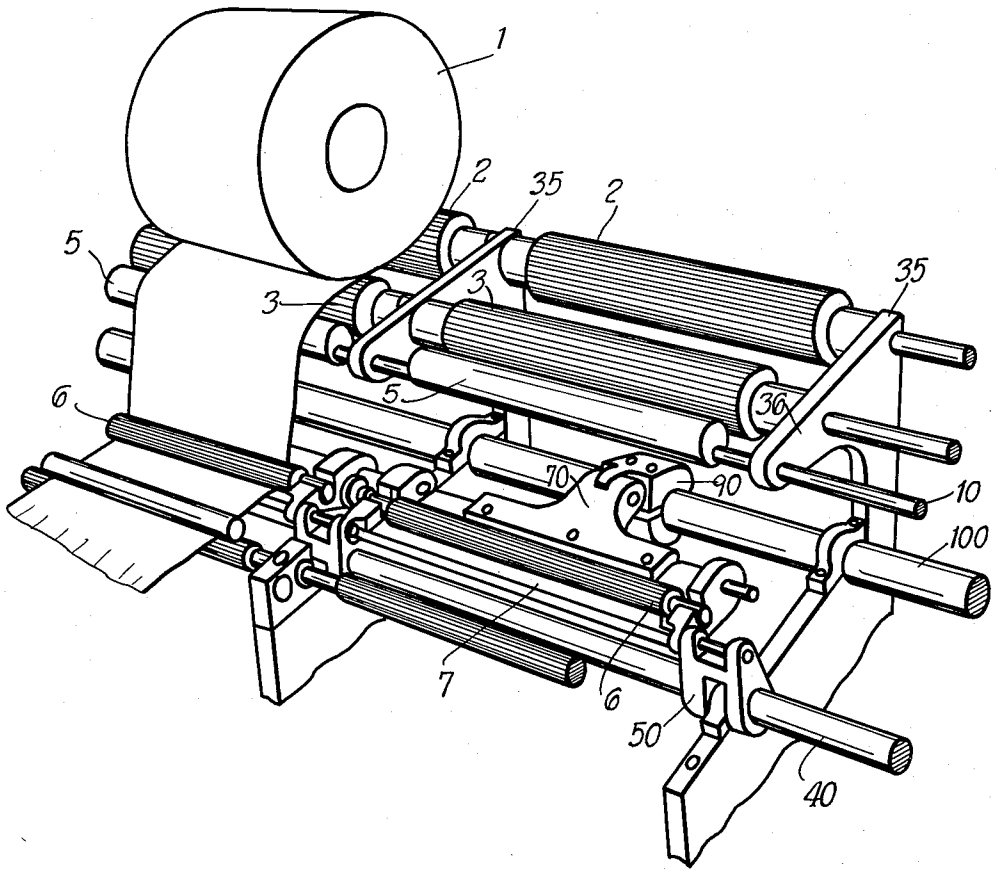
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Fig. 4.



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United States Patent Office 3,041,675 Patented July 3, 1962

3,041,675

SUPPLYING LAP TO THE NIPPERS OF COMBING MACHINES

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Filed May 28, 1958, Ser. No. 738,540
Claims priority, application Switzerland, June 7, 1957
2 Claims. (Cl. 19—116)

The present invention relates to improved means for supplying lap to the nipper mechanism of a combing machine.

A conventional apparatus for supplying the lap to the nippers of a combing machine includes two movably interconnected guide plates, one of which is movably connected with the frame of the nipper mechanism and the other of which is movably supported adjacent to the rolls carrying the lap roll. In this arrangement the path of the lap travelling from the lap roll to the feed roller of the nipper mechanism is always the same and is independent of the movement of the nippers.

The aforedescribed conventional arrangement is suitable for relatively slowly operating nipper and combing mechanisms. In combing machines operating at 150 and more combing cycles per minute this conventional apparatus is too noisy and machanically unsatisfactory. To overcome the disadvantages of the mechanisms having swinging support plates for the lap which plates are connected with the nippers it has been suggested to omit the swinging support plates.

In order to avoid the vibrations of the lap at high speed combing operation, if the guide plates are omitted, which vibrations cause considerable irregularities in the draft of the lap, the distance between the feed roller and the nearest stationary lap guide was reduced. This, however, increases the differences of the length of the path travelled by the lap between the end positions of the nippers, causing faulty drafts.

It is an object of the present invention to provide guide means for the lap travelling to the feed roller which is connected with a nipper of the nipper mechanism of a combing machine which guide means compensate the periodic change of the length of the path of the lap between a stationary nip and the nip between the feed roller and the nipper plate with which the feed roller cooperates. This change is caused during each combing cycle by the movement of the nipper and the feed roller connected therewith relatively to the stationary nip. The guide means according to the invention include a deflecting element around which travels the lap on its way to the feed roller of the combing machine and which element is oscillated on a stationary support synchronously with the oscillations of the nipper mechanism and of the feed roller forming part of the nipper mechanism. Preferably the aforesaid guide element is in the form of an oscillating eccentrically supported roller.

The lap roll, due to its inertia, performs reciprocating motion which may cause periodic lifting of the lap roll off its carrier rollers and which contributes to the change of the length of the path of the lap between the lap roll and the feed roller of the combing machine, if the latter is operated at great numbers of combing cycles per time unit whereby the movement of the lap roll is much accelerated and retarded.

The great accelerations of the lap produce a periodic pressing effect which hurts the outer layer of the lap and produces an undulating surface which is responsible for poor clamping of the lap by the nippers and for pulling out tufts by the circular comb.

The last mentioned difficulties are overcome, according to the invention, by continuously driving the carrier rolls

for the lap roll at substantially constant speed, in contradistinction to the conventional arrangements. The continuous drive is effected by including the carrier rolls by conventional means in the conventional general drive mechanism for the combing machine.

The novel features which are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, and additional objects and advantages thereof will best be understood from the following description of an embodiment thereof when read in connection with the accompanying drawing in which:

FIG. 1 is a diagrammatic illustration of a nipper mechanism of a combing machine in the rear dead center position and of supply means for conducting lap to the nipper mechanism.

FIG. 2 is a diagrammatic illustration of the apparatus shown in FIG. 1 with the nipper mechanism in forward dead center position.

FIG. 3 is a diagram illustrating the length of the path of travel of the lap from a lap supplying roll to a feed roller forming part of a nipper mechanism of a combing machine at various positions of the nipper mechanism having no compensation whatsoever.

FIG. 4 is a perspective view of the structural design of the nipper mechanism in conjunction with the novel lap supply.

Referring more particularly to the drawings, numeral 1 designates a lap roll of fibrous material resting on two carrier rolls 2 and 3 which are rotated at a substantially uniform speed by conventional means, not shown, and supported by a frame 35. The lap 4 running off the roll 1 passes around a compensation roller 5 likewise supported by the frame 35 and thereupon onto a feed roller 6 of a nipper mechanism including a bottom nipper 7 onto which the lap 4 is pushed forward by the rotating feed roller 6. The feed roller 6 is supported by the bottom nipper 7 and rotates synchronously with the movement of the bottom nipper. The bottom nipper 7 is supported by an arm 50 which is swingable on a shaft 40. The shaft 40 carried by the frame 35 supports a conventional circular comb whose periphery K is shown by a dash-dot circle in FIG. 1 and 2 but not shown in FIG. 4. The bottom nipper 7 is driven by a crank 90 the free end of which is pivoted to the rear end of a bracket element 70 connected with the rear of the bottom nipper 7. The crank 90 is fast on an oscillating drive shaft 100 rotatably mounted on the frame 35.

FIG. 1 shows the nipper mechanism in the rear dead center position in which the distance between the nip 8 of the lap roll 1 and the carrier roller 3 and the axis of rotation of the compensation roll 5 plus the distance between said axis of rotation and the nip 9 of the feed roller 6 and the bottom nipper 7 is relatively great.

The length S of the aforedescribed path at various positions of the bottom nipper is shown in the diagram FIG. 3. The rear dead center position of the bottom nipper is marked "HT" in FIG. 3, the ordinate at this point indicating the relatively great length of the path. When the bottom nipper 7 moves forward, i.e., to the left in FIG. 1, the length of the path S is gradually reduced till it reaches a minimum value somewhere between the rear dead center position HT and the front dead center position VT. Thereupon the length of the path gradually increases until it reaches a maximum value at the forward dead center position as shown by the solid line of FIG. 3.

In order to compensate the changes of the length of the path of the lap between the lap roll 1 and the feed roller 6 an oscillatingly driven shaft 10 is rotatably mounted in a forward projection 36. The axis of shaft 10 is parallel to the axes of the rollers 6 and 3, and a cylindrical compensation roll or cylinder 5, whose diameter

is about twice as great as that of the shaft **10**, is eccentrically mounted on the shaft **10**. By suitable choice of the diameter of the cylinder **5**, of the eccentricity and of the oscillation angle α (FIG. 2) the lengths of the path S shown in FIG. 3 is made substantially uniform during each play of the nipper mechanism as shown by the dash and dot line. The extreme position of the cylinder **5** at the front dead center position of the nipper **7** is shown by a solid line circle in FIG. 2. The position of the cylinder **5** at rear dead center position is shown by a dashed circle **5'** in FIG. 2, and the postion of the cylinder **5** when the nipper **7** is between its two dead center positions (position M) is shown by a dash-dot circle in FIG. 2.

The discrepancy between a continuous supply of the lap due to the continuous rotation of the rollers **3** and **2** and an intermittent feed by the feed roller **6** can be compensated by changing the configuration of the surface of the cylinder **5** to a suitable non-cylindrical configuration. This compensation is not needed, if the intermittent feed periods are relatively short.

The shaft **10** is oscillated synchronously with the shaft **100** driving the nipper **7** whereby the oscillation angle α is smaller than 180°. The means for oscillating the shafts **10** and **100** are conventional and are connected with the conventional drive head at the end of the combing machine. These means are not illustrated because they do not form part of the present invention. The location of the middle position M about which the shaft **10** is oscillated depends on individual conditions to which the mechanism must be adapted. In the illustrated case the line M indicating the middle of the oscillation is inclined to the horizontal by an angle of approximately 45°.

I claim:

1. In a combing machine having a carrier roller for supporting the lap roll and forming a stationary nip therewith, an oscillating nipper, a feed roller supported by and oscillating with said nipper, and a stationary frame rotatably supporting said carrier roller and swingably supporting said nipper: lap deflecting means engaging the lap between said stationary nip and said feed roller for compensating the changes of the length of the path of the lap between the stationary nip and said feed roller during each combing operation, said deflecting means being positively oscillated in synchronism with the nipper for deflecting the lap to an extent compensating the change of length of the path between the stationary nip and the feed roller due to the movement of the nipper.

2. In a combing machine as defined in claim 1 and wherein said deflecting means comprises a positively oscillated shaft oscillatingly supported by said frame, and a cylinder eccentrically supported by said shaft.

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