

- [54] **ARRANGEMENT OF REED TEETH ON A WAVE-TYPE LOOM**
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- [58] Field of Search.....**139/12, 188, 191, 189**

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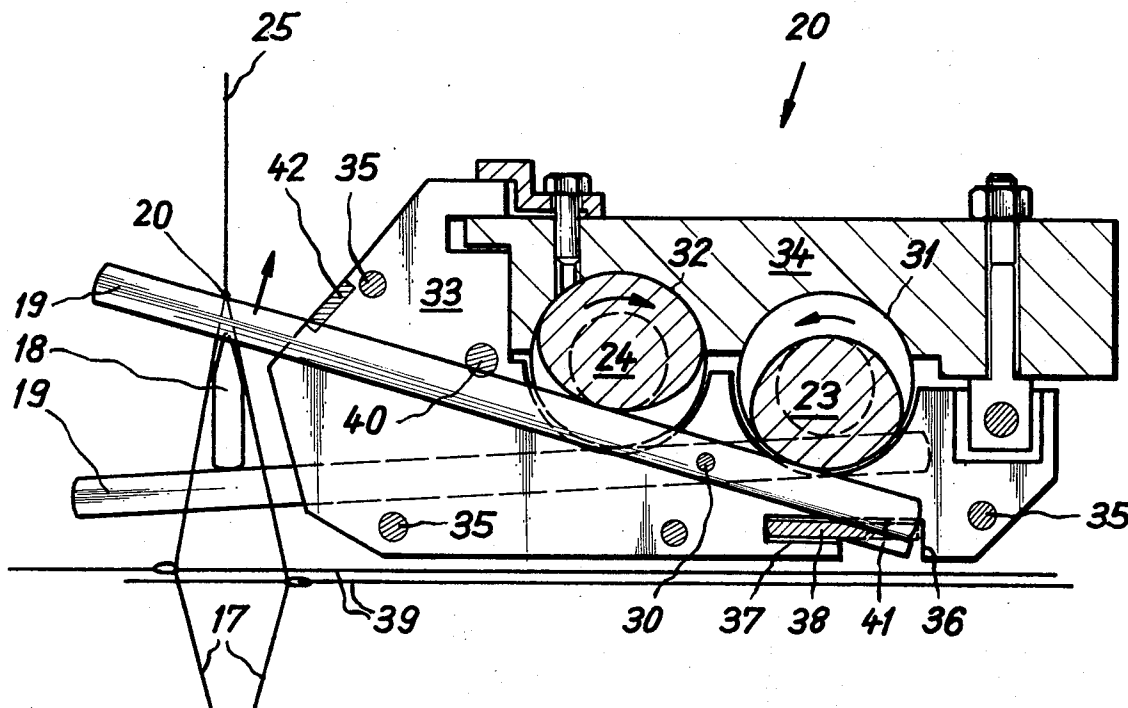
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[57] **ABSTRACT**

An arrangement of reed teeth for use on a wave-type loom, which comprises a plurality of reed teeth arranged side by side in a row, means for moving said teeth successively towards beat-up positions at the fabric beat-up point of the loom whereby said teeth, as a whole, execute an undulatory movement; and resilient material means positioned along the row of reed teeth so that the reed teeth strike this material before reaching their respective beat-up positions.

7 Claims, 2 Drawing Figures

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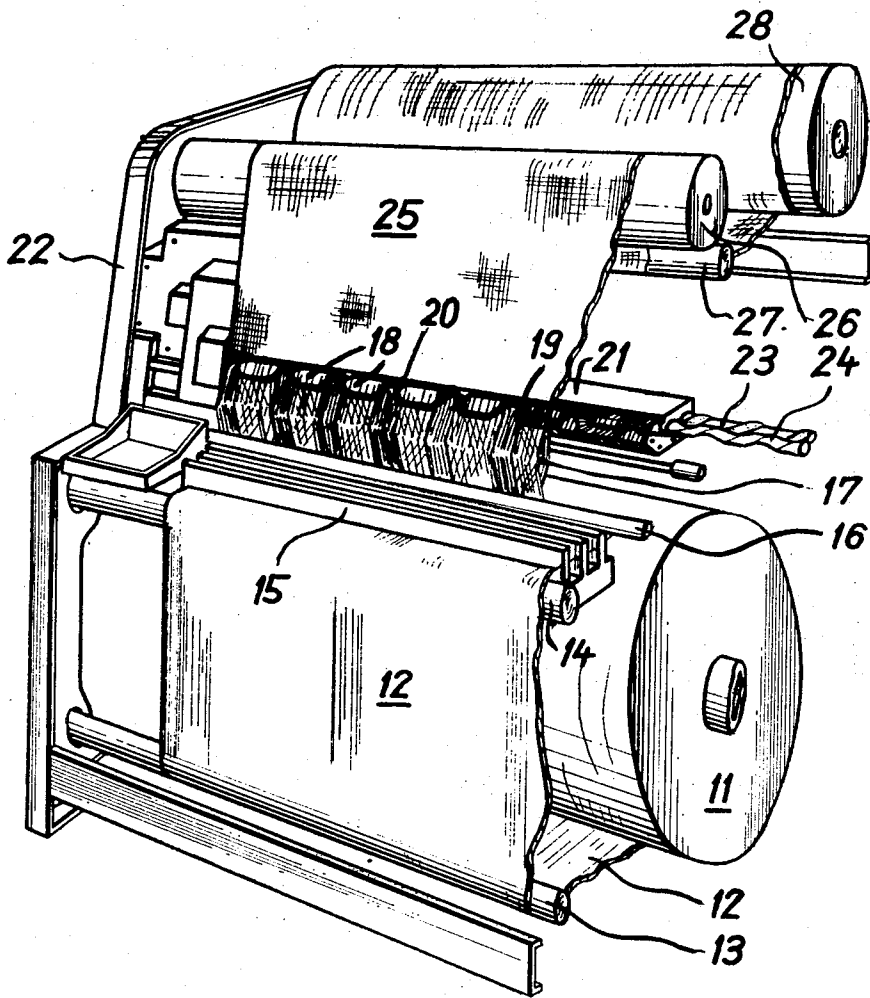


Fig. 1

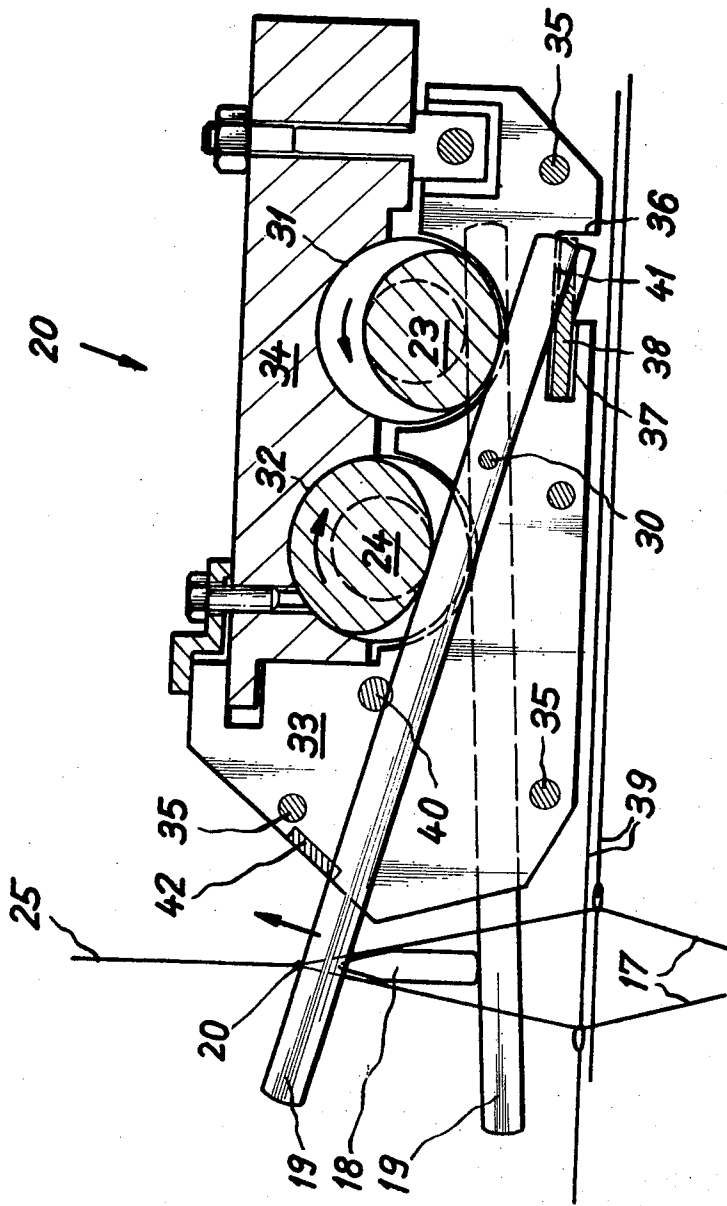


Fig. 2

ARRANGEMENT OF REED TEETH ON A WAVE-TYPE LOOM

This invention relates to an arrangement of the reed teeth on a wave-type loom and more particularly to a reed teeth arrangement in which a plurality of reed teeth are arranged side by side in a row and, when the loom is operating, are moved successively toward the fabric beat-up, and thereby as a whole, execute an undulatory movement, said arrangement having means for improving the uniformity of the weave produced on the loom.

Wave-type looms are known in which the reed teeth are individually operated and wherein the beat-up of the weft thread does not take place simultaneously over the whole width of the loom, but takes place successively or continuously over the width of the loom. The movement of the reed teeth into the beat-up position is kept as precise as possible so that the fabric beat-up line is as straight as possible. Even when the reed teeth are positively driven during their swinging movement, they must, nevertheless, have a certain degree of play (or freedom of movement). This play is necessitated by the construction and the mode of operation. In an arrangement in which there is no play, there arises the danger of certain parts being overstressed, so that they can become jammed and even deformed.

In their beat-up positions, all the reed teeth should beat-up in a precisely uniform manner in the interest of obtaining a good quality of fabric. During the beat-up movement, the reed teeth execute a reversing movement at a very high speed. As a result of the considerable acceleration which then occurs, large forces are created. As a consequence of the play, the reed teeth then lose contact with their drive means when they beat-up the weft thread. The extent to which this contact is lost depends upon the friction and the force necessary for beating-up.

A curved or undulatory beat-up line is thereby caused, particularly in the case of fabrics of low weft density. It is of course those reed teeth which move more easily that beat-up the weft thread more compactly than do the other teeth.

The above-mentioned disadvantages become more evident the faster the loom operates. One object of the present invention is to eliminate such disadvantages. Thus, the arrangement of reed teeth in accordance with this invention is characterized in that a resilient material means is positioned along the row of reed teeth so that the teeth strike this material before reaching their beat-up positions.

The invention will now be described in more detail by reference to one of its embodiments and to the accompanying drawing, in which:

FIG. 1 is a perspective view of a loom equipped with the reed teeth arrangement according to the invention; and

FIG. 2 is a detailed illustration of the reed teeth arrangement according to the invention.

The perspective illustration of a wave-type loom or multi-phase weaving machine seen in FIG. 1 shows how the reed teeth are arranged on this machine. The warp threads 12 run from a warp beam 11 over the guide rolls 13 and 14 and through a warp thread monitor 15 and around a roll 16, which can be designed as a shed-equalization roll. The warp threads 12 are formed into

a shed immediately beyond the roller 16 by means of a heald arrangement comprising substantially horizontal needles, which are not shown in FIG. 1. An open shed 17 is present at the point where the forward portion of each inserting member or shuttle 18 is located, and a shed change takes place between each two adjacent shuttles 18. This situation is indicated in the drawing by appropriate hatching. For the purpose of carrying out the weaving operation, there is provided a plurality of weft thread inserting members in the form of shuttles 18, which move over the loom simultaneously and successively. The shuttles 18 are moved forwards by the reed teeth 19 acting as drive elements. The reed teeth are in the form of thin blades. They also serve to beat-up the inserted weft threads at the fabric beat-up point or fell 20. The shuttles 18 are guided in each shed 17 by the warp threads 12. The reed teeth 19 are incorporated in the arrangement or drive 21, which is firmly secured to the loom frame 22. Two drive shafts 23 and 24, extending through the arrangement 21, impart movement to the reed teeth 19. Each of these shafts has a helical profile or exterior. As a result of this profile the reed teeth 19 are swung about a pivot shaft (designated by numeral 30 in FIG. 2) during rotation of the drive shafts 23 and 24, in such manner that each tooth 19, during the cycle of its movement, is always ahead of the tooth preceding it by a small amount. In this way the reed teeth 19 as a whole execute an undulatory movement which, in FIG. 1, progresses from right to left, and the shuttles 18 are carried along by this movement. The sheds 17 also move from right to left at the same speed. The woven material 25 passes over the pull-in roller 26 and the pressure roller 27 and is rolled on to the cloth beam 28.

FIG. 2 shows a cross-section through the arrangement 21 in the direction at right-angles to the axes of the drive shafts 23 and 24. In FIG. 2, the blade-like reed teeth 19 are shown in the extreme positions of their swinging movements. The reed teeth or blades 19 are swung about the shaft 30 along which they are arranged side by side. One of the sheds 17, the fabric 25 and a shuttle 18 are likewise shown in FIG. 2. In addition, two of the heddles 39 for forming the shed are illustrated.

The drive shafts 23 and 24 are mounted in openings 31 and 32. The openings are formed in part by the carriers 34. Also, guide elements 33 are provided for the reed teeth 19. The guide elements 33 are thin broad-faced structures, which can be made from sheet metal or sheets of synthetic material by stamping. They are arranged side by side in a row parallel with each other. The guide elements 33 are assembled to form a pack by means of rods 35 which are pushed transversely through them. A blade-like reed tooth 19 is fitted between each pair of adjacent elements 33, the broad sides of the blades 19 being disposed parallel with the faces of the guide elements 33. The reed teeth 19 are prevented from bowing laterally by the guide elements 33. The guide elements 33 and the carriers 34 are interconnected.

When the loom is operating, the two drive shafts 23 and 24 are rotated in the directions indicated by the arrows. The helical profiles of the shafts 23 and 24 contact the reed teeth 19 to cause the prescribed swinging movement of these elements between their extreme

positions; the reed teeth or blades as a whole executing a waveslike movement. During this movement, the upwardly moving reed teeth 19 press against the inclined rear edge of the shuttles 18, so that the shuttles are driven to the left in the illustration shown in FIG. 1. When the parts of the reed teeth 19 that extend through the shed 17 are located in their uppermost extreme positions, they beat-up the weft thread which runs out of the shuttle 18 that has just passed through, i.e., the weft thread that has just been inserted into a shed.

In order to eliminate the initially mentioned disadvantages, each guide plate 33 contains an opening which includes a first slot 36 from which extends a second slot 37. When the guide plates 33 are assembled as a finished pack, these slots or notches are in precise register as the slots are aligned with each other. A length 38 of resilient, yielding material, e.g., rubber, is held in the second slot 37. This material is positioned in such a way that the reed teeth 19 strike it before they reach their thread beat-up positions. Thus, as shown in FIG. 2, the material 38 is depressed somewhat from the position shown in broken lines and indicated by the reference numeral 41. In this way an extremely precisely defined, play-free positioning of the reed teeth 19 is obtained during the beat-up of the weft thread. The uniformity of the weave is thus considerably improved.

In the arrangement illustrated, each reed tooth 19 constitutes a double-armed lever, one arm of which extends through the illustrated shed 17 and is longer than the other arm remote from the shed 17 by reference to the shaft 30. It is of advantage to cause the shorter lever arm to strike the resilient material 38. The force applied by the lever arm is thus greater, so that a harder material 38 can be used. Such harder material will, as is well known, retain its resiliency longer than a relatively soft material. Furthermore, this location represents the best available space. Also little fly forms in this area.

In another embodiment of this arrangement, each guide element 33 contains an orifice 40, and a length of rubber strip of round cross-section is pulled through these orifices 40; this material is slightly drawn tight in the assembled position and is positioned transversely of the elements 33. The arrangement according to the in-

vention can also be such that there is provided at the location 42 a strip of rubber which, like the resilient strip 38, is of elongate cross-section.

What is claimed is:

5 1. An arrangement of reed teeth for use on a wave-type loom which comprises a plurality of reed teeth arranged side by side in a row; means for moving said teeth, when the loom is operating, successively toward beat-up positions at the fabric beat-up point of the loom whereby said teeth, as a whole, execute an undulatory movement; and resilient material means positioned along the row of reed teeth and spaced therefrom so that the reed teeth strike this material means before reaching their respective beat-up positions.

15 2. The arrangement of claim 1 in which the reed teeth are arranged along a pivot shaft and can be swung about this shaft as double-armed levers, the shorter arms of the reed teeth are located on the side remote from the sheds formed during the weaving operation in reference to the pivot shaft, and the resilient material means is positioned at the locality of the free ends of the shorter arms.

20 3. The arrangement of claim 1 in which broad-faced guide elements are arranged side by side to comprise a pack, the reed teeth are guided between each pair of adjacent guide elements, and the guide elements act as carriers for the said resilient material means.

25 4. The arrangement of claim 3 in which each of the guide elements contains an opening and these openings are aligned when the guide elements are assembled side by side, and the resilient material means is fitted in these openings.

30 5. The arrangement of claim 4 in which each opening takes the form of a first slot from which a second slot extends, and the resilient material means after having been pushed into the second slot is held thereby and then extends into the first slot.

35 6. The arrangement of claim 4 in which each opening takes the form of an orifice and the resilient material means, in the form of a rubber strip, is drawn through these orifices transversely of the guide elements.

40 7. The arrangement of claim 1 in which said resilient material means is rubber-like material.

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