United States Patent

Strauss

[15] **3,678,966**

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[54] REED TOOTH ARRANGEMENT ON A WAVE-TYPE LOOM

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[52] **U.S. Cl.** **139/12**, 139/188

[51] **Int. Cl.** **D03d 47/26**

[58] **Field of Search** 139/12, 13, 96, 188, 190

[56] **References Cited**

UNITED STATES PATENTS

3,477,475 11/1969 Rossmann et al. 139/12

2,461,496 2/1949 Kaufmann 139/96

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[57] **ABSTRACT**

A reed tooth arrangement for use on a wave-type loom, which comprises a plurality of sheet-like guide elements for preventing lateral bending of the reed teeth located therebetween; carrier means for supporting said guide elements, each of said elements having a first retaining portion for mounting on the carrier, said retaining portions registering with each other in the longitudinal direction of the arrangement, and each of the guide elements also having a second retaining portion, said second retaining portion defining an opening that narrows towards the outside and said openings registering with each other in the longitudinal direction of the arrangement; and support means secured to said carrier, said support means having a rod-shaped portion that is pushed through said openings transversely of the guide elements and that is swingably mounted within the openings.

7 Claims, 3 Drawing Figures

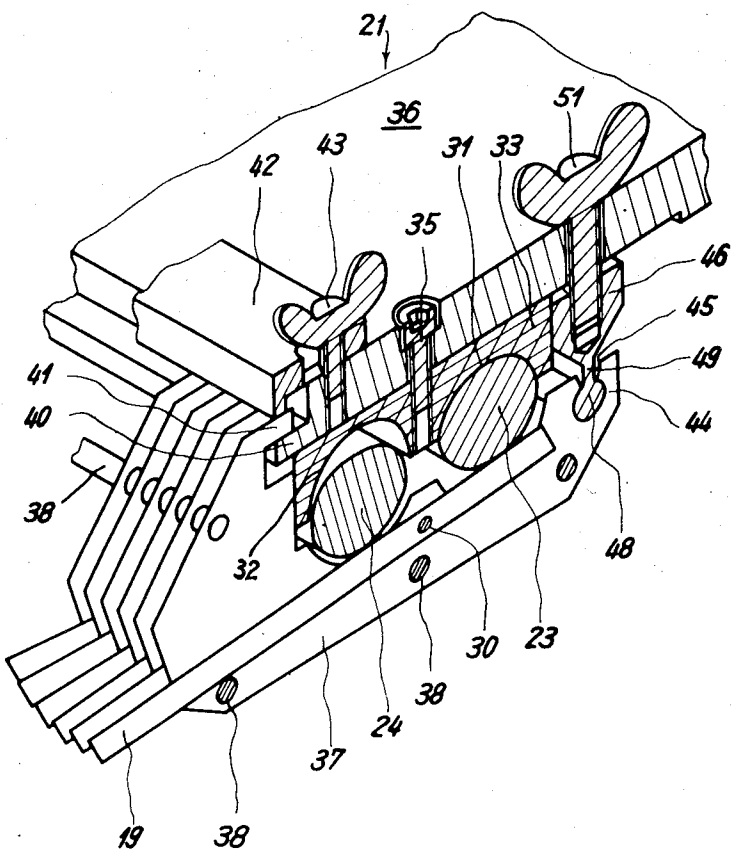
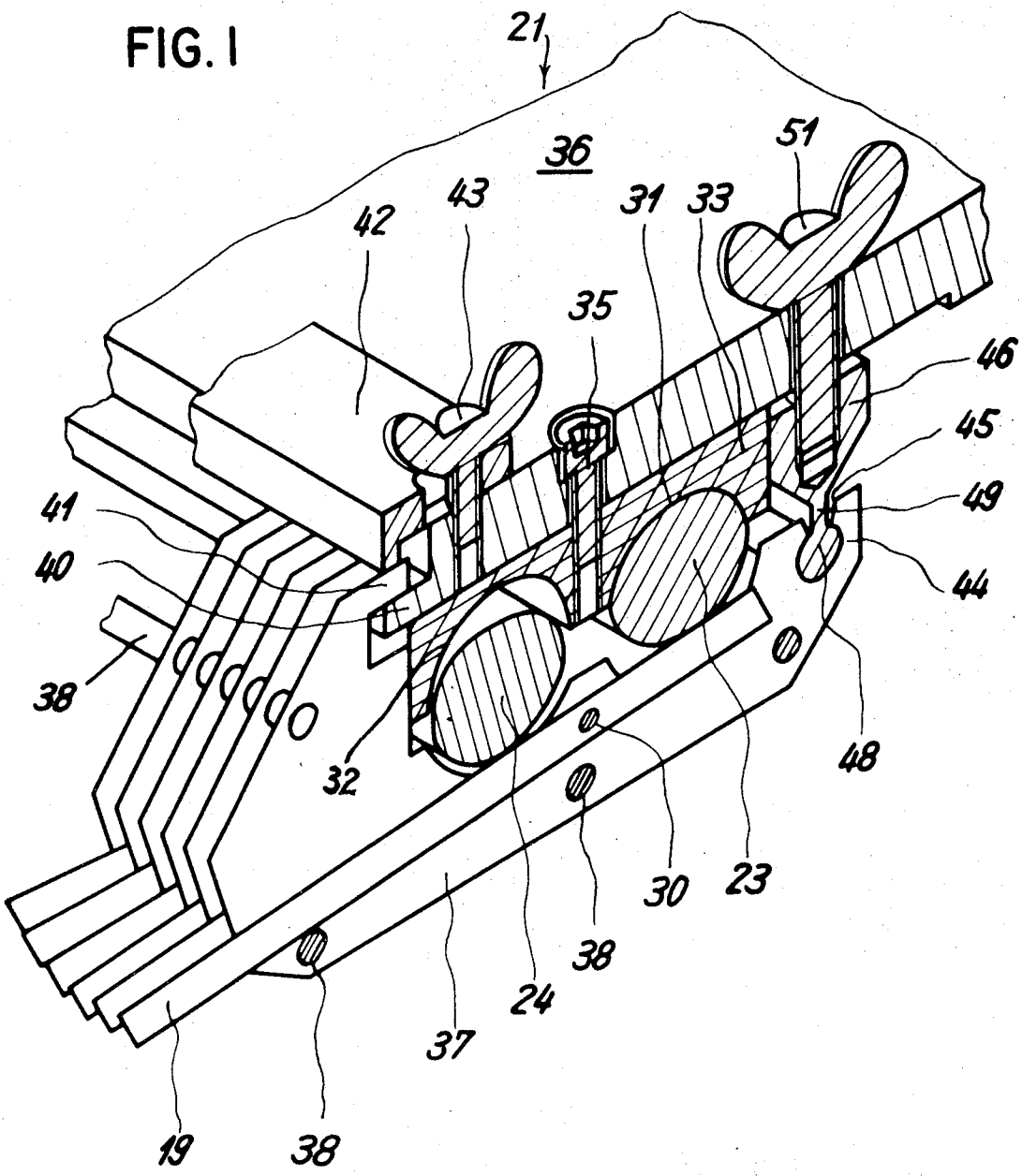


FIG. 1



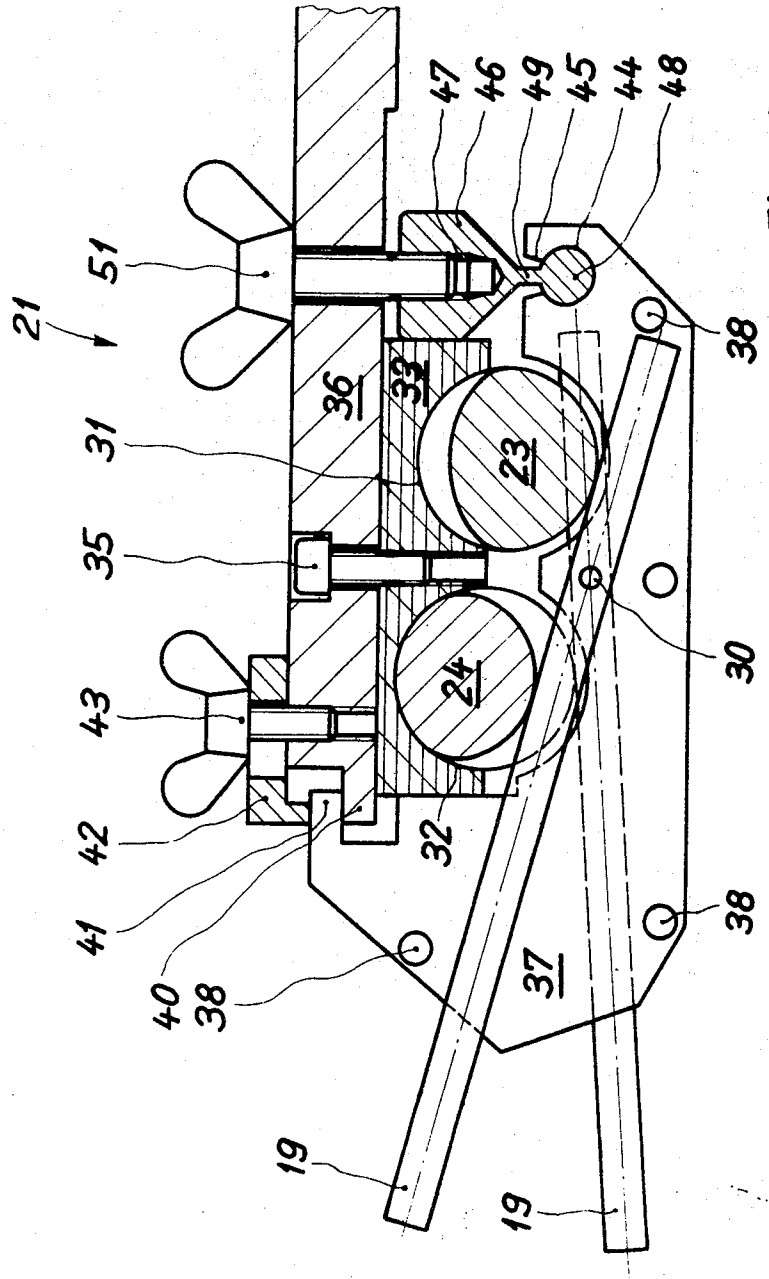

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Fig. 2

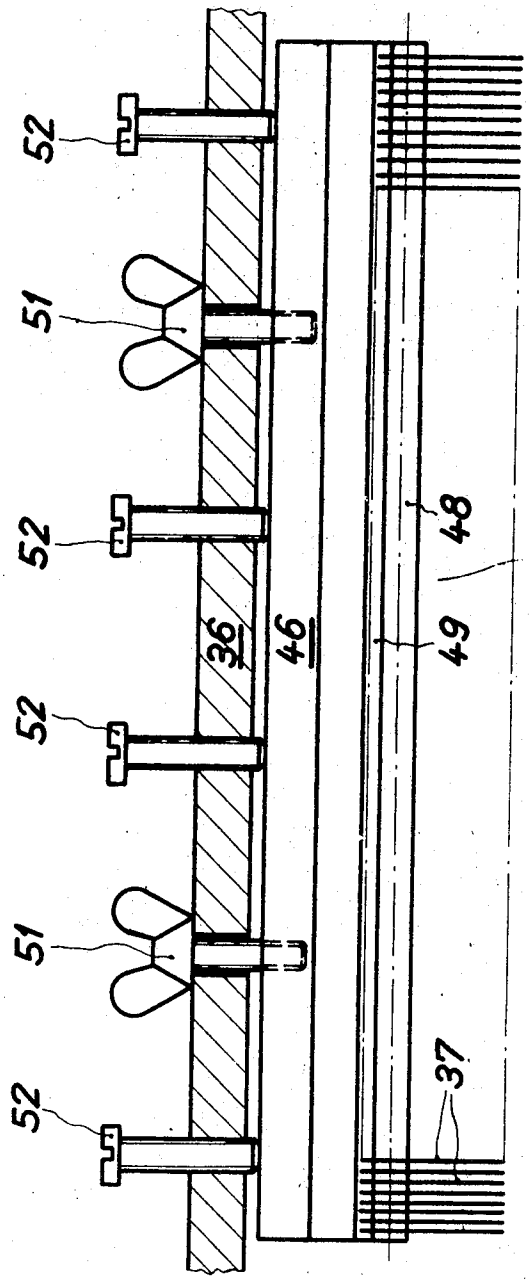

Fig. 3

REED TOOTH ARRANGEMENT ON A WAVE-TYPE LOOM

This invention relates to a reed tooth arrangement for use on wave-type looms and more particularly to an arrangement in which the reed teeth are located between broad-faced guide elements that are positioned parallel with and alongside each other in the longitudinal direction of the arrangement and that each have a retaining portion for mounting on a carrier, the retaining portions registering with each other in the longitudinal direction of the arrangement.

A wave-type loom or multi-phase weaving machine is known and is disclosed in U.S. Pat. No. 3,477,475 in which the guide elements are held together to form a pack by means of a plurality of rods that pass through them. For the purpose of securing the pack on a carrier, openings are provided at uniform distances along one of these rods in a predetermined number of guide elements. These openings are so formed that this rod is free of these guide elements, i.e., it does not pass through them. These guide elements are therefore retained only by the other rods. This one rod is held at its free places, i.e., at the openings, by retaining members, which are, in turn, secured to the carrier.

This securing means or assembly requires that the guide elements forming a pack must be of different shapes. To produce such a pack thus necessitates the manufacture of guide elements of different shapes, and the required number of such elements has to be worked out. Additionally, when the elements are assembled, they have to be counted out accurately and arranged in layers.

As in the case of the known wave-type loom, care has also to be taken to see that the reed tooth arrangement of the invention is advantageously assembled in such a way that the arrangement is first mounted on the retaining parts or portions of the guide elements on a carrier, which elements are arranged longitudinally along a straight line. The arrangement is then swung around the line of suspension into a position corresponding to the mounted condition. In this position it is secured by retaining means to the carrier over a second range extending in the longitudinal direction of the arrangement. In the secured position the retaining means immobilize the pack of guide elements against displacement in the direction of right-angle to the longitudinal direction of the arrangement, i.e., in the secured position the retaining means bear laterally against the guide elements. These retaining means should not be rigidly fixed with respect to the pack of guide elements, as otherwise, when the arrangement is assembled and dismantled, these means would get in the way when swinging from the suspended to the secured position and vice versa.

In accordance with the present invention, the first-mentioned requirements are avoided when making up a pack of similar guide elements. At the same time, the above-described advantageous method of assembling and dismantling the reed tooth arrangement is also possible. Thus, the arrangement of this invention is further characterized in that each of the guide elements comprises a second retaining portion and each second retaining portion contains an opening which narrows towards the outside, and these openings register with each other in the longitudinal direction of the arrangement to accommodate a rod portion of a rail secured to the carrier, said rod portion passing through the openings and being shaped so that it can be pushed therethrough transversely of the guide elements and swingably mounted therein.

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

FIG. 1 shows a perspective view of a portion of the reed tooth arrangement of this invention as in a wave-type loom, partly in section;

FIG. 2 shows a sectional view at right-angles to the longitudinal direction of the reed tooth arrangement; and

FIG. 3 shows a rear view of the reed tooth arrangement shown in FIG. 2.

In all the figures like elements are indicated by like reference numerals.

The perspective illustration of a portion of a wave-type loom, or multi-phase weaving machine, in FIG. 1 shows how the reed tooth arrangement of the invention is disposed on the loom. For the purpose of weaving, there is provided a plurality of shuttles (not shown), which move simultaneously one after the other over the width of the loom. The shuttles are moved forwards by the reed teeth **19** which act as drive elements. The reed teeth **19** are in the form of thin elongated blades, and are used for beating up the inserted weft threads. The reed teeth **19** are incorporated in the arrangement **21** which supports the reed teeth much in the manner of the arrangement (**20**) in the aforesaid U. S. Pat. No. 3,477,475. The arrangement is firmly secured to the loom frame. Two drive shafts **23** and **24**, extending through the arrangement **21**, impart movement to the reed teeth **19**. These shafts each have a helical profile or exterior shape. As a result of this profile, and upon rotation of the drive shafts **23** and **24** about their longitudinal axes, the reed teeth **19** are swung about a shaft (shaft **30** shown in FIG. **2**) in such a way that each tooth **19** is always a small distance ahead of the preceding tooth during its cycle of movement. This creates, in the reed teeth **19** as a whole, an undulatory movement which progresses from right to left, as viewed in FIG. **1**, and which drives the shuttles along across the loom.

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**, as drawn, are in the end positions reached in their swinging movements. The reed teeth **19** are swung about the shaft **30** along which they are arranged side-by-side.

The drive shafts **23** and **24** are mounted in the troughmembers **31** and **32** provided in the bearing block **33**. This block is firmly connected to the carrier **36** by means of the threaded bolts **35**. The threaded bolts **35** are spaced at uniform distances apart in the longitudinal direction of the reed tooth arrangement.

The reed blades **19** are arranged between guide means in the form of guide elements **37**. The guide elements **37** are thin, broad-faced plate-like structures, which can be made, by stamping, from sheet metal or plastic sheets. They are arranged side-by-side and parallel with each other. By means of the rods **38**, pushed transversely through the guide elements **37**, these elements are made up into a pack which extends over the entire width of the loom. Between each pair of adjacent elements **37**, there is provided a blade-like reed tooth **19**, the broad sides of the teeth **19** lying parallel with the faces of the guide elements **37**. These elements prevent the blades **19** from deflecting laterally. In order to keep the guide elements **37** at precise distances apart, distance pieces, or spacer means, are provided between them. These means can take the form of helically wound wires, such wire being fitted around each of the rods **38**, and one turn of the wire being present between each two adjacent guide elements **37**. These wire distance pieces are not shown in the drawing. In this arrangement, the pack of guide elements incorporates the elements **37**, the rods **38** plus wire distance pieces, the pivot shaft **30** carried by the elements **37**, and the blades **19** arranged along this shaft.

The pack of guide elements is supported at its front end by the carrier **36**. For this purpose the carrier has a projection or ledge **40**, and each element **37** has a nose or retaining projection **41** which bears on the ledge **40**. In the assembled condition, the projection **41** is secured by the rod **42** when the screws **43**, distributed over its length, apply pressure to it.

At the rear end, the guide elements **37** each contain a retaining portion including a circular opening **44**. Each of these openings **44** comprises an outwardly extending narrowed portion **45**. A rail **46** is fitted transversely of the elements **37**. It comprises a supporting portion having a threaded bore **47**, a rod portion **48**, and a strip-like intermediate part **49**. The rod portion **48** fits exactly into the openings **44** and is pushed through them in the direction at right-angles to the elements **37**. The rail **46** is secured to the carrier **36** by means of the screws **51**.

It is very important that, in the assembled condition, the pack is positioned with the necessary precision relatively to the drive shafts **23** and **24**. In order to prevent lateral displacement of the pack, it bears exactly, by one end, on the left-hand end of the block **33**. When the screws **51** are tightened, the rail **46** bears accurately on the right-hand end of the block **33**.

In order to dismantle the pack of guide elements, first of all the screws **43** are loosened. This releases the retaining rod **42**, and the projections **41** rest loosely on the ledge **40**. The screws **51** are then loosened. This releases the rail **46**, and the pack of guide elements hangs loosely by the projections **41** on the ledge **40**, so that the pack can than be removed. To enable the pack to begin to swing downward, the rail **46** must be capable of turning in the openings **44**. Otherwise, with the elements **37** and **46** bearing flat against the block **33**, the supporting portion of the rail **46** would not be able to move past the lower edge (right-hand edge in FIG. **2**) of the bearing block **33**. Assembly of the pack takes place in a sequence which is the reverse of that described in connection with dismantling.

The pack of guide elements should be fitted in such manner that the play between the blades and the drive shafts **23** and **24** is so adjusted that clamping or binding is just avoided. An example of a construction that enables accurate adjustment of this kind to be achieved is illustrated in FIG. **3**. This figure shows a view of the arrangement shown in FIG. **2** as seen from the right.

FIG. **3** again shows the carrier **36**, the screws **51** passing therethrough, the rail **46**, comprising the rod portion **48** and the strip-like intermediate portion **49**, and the guide elements **37**. Also provided are distance elements (vertical spacer means) in the form of screws **52**. These spacer means are fitted in screw-threaded portions in the carrier **36** and their ends bear against the rail **46**. By setting the screws **52**, the distance between the elements **36** and **46** can be accurately adjusted. The screws **51** are then tightened.

What is claimed is:

1. A reed tooth arrangement for use on a wave-type loom which comprises: a plurality of reed teeth and sheet-like guide elements for preventing lateral bending of the said reed teeth located therebetween; carrier means for supporting said guide elements, said elements being positioned parallel with and alongside each other in the longitudinal direction of the arrangement, each of said elements having a first retaining portion for mounting on the carrier means, said first retaining portions registering with each other in the longitudinal direction of the arrangement, and each of the guide elements also having a second retaining portion, said second retaining portions each defining an opening that narrows towards the outside of said elements and said openings registering with each other in the longitudinal direction of the arrangement; and support means secured to said carrier means, said support means having a rod-shaped portion that is pushed through said openings transversely of the guide elements so that said elements can swing about said rod-shaped portion which is swingably mounted within the openings.

2. The arrangement of claim **1** in which the support means includes a strip portion and the rod-shaped portion merges with the strip portion and said openings each have a narrowed portion wider than the thickness of the strip portion, said strip portion being accommodated in said narrowed portions.

3. The arrangement of claim **1** in which said support means comprises a rail having three portions extending in the longitudinal direction of said arrangement, one portion being the rod portion, the second being a supporting portion screw-threaded to receive screws, and the third being a strip-like intermediate portion located between the rod portion and the supporting portion.

4. The arrangement of claim **1** in which spacer means are provided at the said carrier means so that the distance between said support means and said carrier means can be adjusted as required by said spacer means.

5. The arrangement of claim **4** in which at that position wherein the arrangement and the loom are fitted together, the support means is secured to the carrier means by fastening means contained in said carrier means, and said spacer means comprise screws which serve as distance elements and bear against the support means.

6. The arrangement of claim **5** in which the support means comprises a rail and said distance elements bear against the said rail.

7. The arrangement of claim **1** in which the openings and the cross-section of the rod portion are circular.

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