United States Patent

Demuth

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[54] LOOM SLEY

[72] Inventor: **Hans Demuth,** Winterthur, Switzerland

[73] Assignee: **Sulzer Brothers, Ltd.,** Winterthur, Switzerland

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[51] **Int. Cl.** **D03d 49/62**

[58] **Field of Search** 139/188–192

[56] **References Cited**

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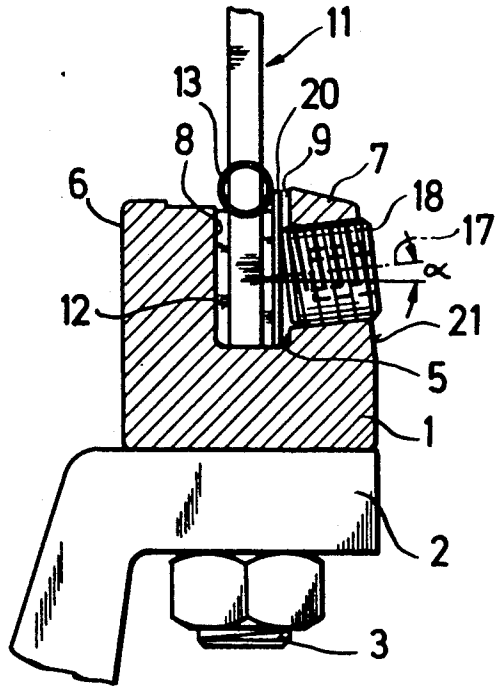
Primary Examiner—Henry S. Jaudon

Attorney—Kenyon & Kenyon Reilly Carr & Chapin

[57] **ABSTRACT**

The loom sley has a flange in which the pressure screws are initially mounted in angular relation to a perpendicular plane to the screw contacting surface on the comb. On tightening of the screws against the comb foot, the flange bends elastically outwardly so that the flat heads of the screws come into full bearing contact on the comb foot.

9 Claims, 3 Drawing Figures



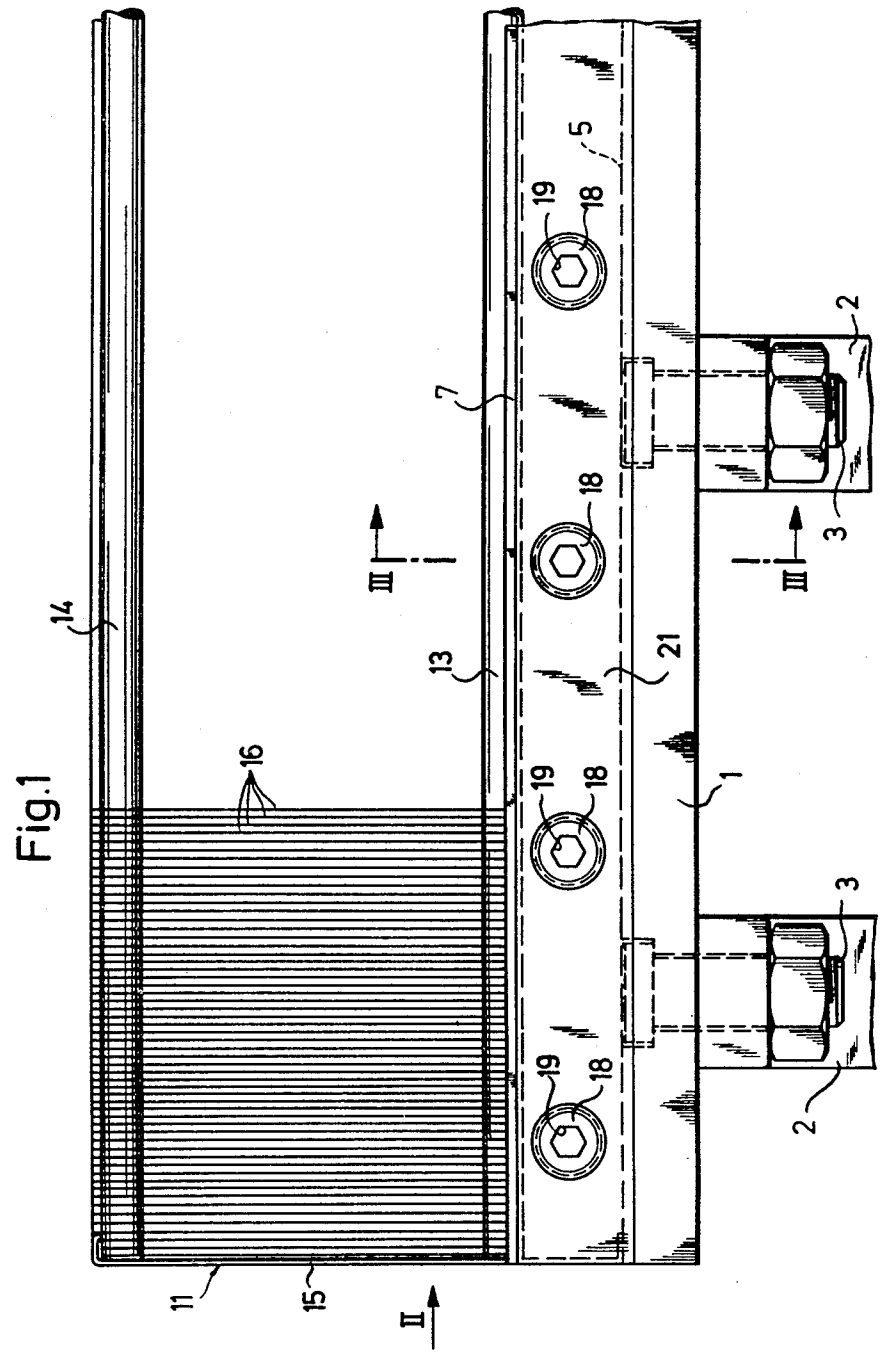


Fig.1

Inventor:
HANS DEMUTH

BY Kenyon + Kenyon Reilly Carr + Chapin
ATTORNEYS

Fig. 2

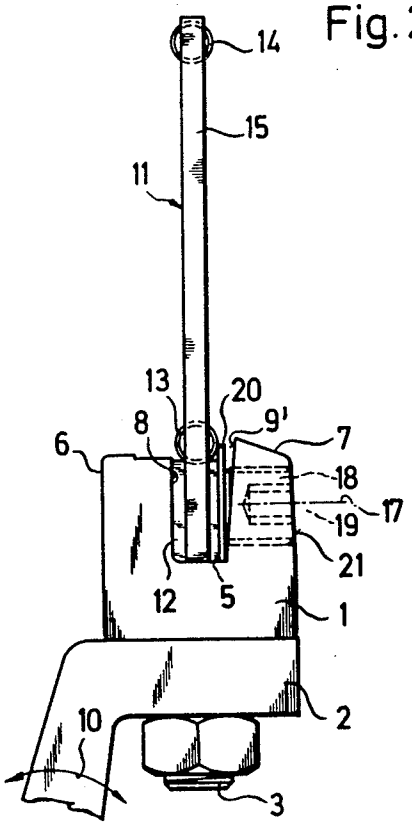
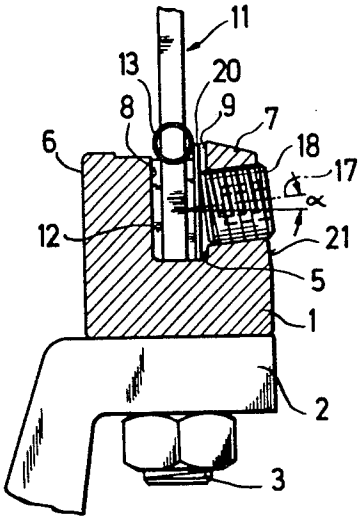


Fig. 3



Inventor:
HANS DEMUTH

BY Kenyon + Kenyon Reilly Carr + Chapin
ATTORNEYS

LOOM SLEY

This invention relates to a loom sley and more particularly to a loom sley having means to secure a comb therein.

Loom sleys have been known which have a groove-like recess in order to receive a foot portion of a comb as well as a number of pressure screws which have been threaded through a wall of the sley forming the recess in order to abut the foot portion and retain the same within the groove upon tightening of the screws. Generally, these pressure screws have been threaded into screw-threaded holes having axes which have been set perpendicularly to the side face of the comb foot being fastened.

However, in such constructions, it is possible for excessive local stresses to occur because of the pressure imposed on the clamped-in foot part. That is, when the pressure screws are tightened, the part of the sley profile containing the pressure-screws bends so that the screws set themselves increasingly at an angle relative to the side face of the comb foot. As a result, the screws eventually bear with only a part of their end face, namely with a lower rim part, against the side face of the comb foot while the upper part of the end face does not come into contact, or only insufficiently so, with the side face of the comb foot.

In order to overcome this canting action between the screws and comb foot, it has been proposed to strengthen the sley profile. However, this is not practical since the sley like all the other parts of the loom that oscillate or pivot continuously during operation requires as small a weight as possible.

Accordingly, it is an object of the invention to avoid unfavorable stresses in the mounting of a comb in a loom sley.

It is another object of the invention to effect a simple mounting of a comb in a loom sley.

Briefly, the invention provides a loom sley which has a comb receiving groove defined in part by a flange which has a plurality of threaded screw holes therein, each of which is disposed on an axis inclined at an angle from a perpendicular plane to the contact surface of the comb to be received. The flange is sized so as to deflect, or deform, elastically away from the groove upon tightening of a plurality of pressure screws in the respective screw holes against the contact surface of a received screw. The angle of inclination of each screw axis is further directed oppositely to the direction of deformation of the flange so that the angle flattens toward the perpendicular plane upon deformation of the flange. The magnitude of the angle of inclination of the screw axes corresponds to a predetermined elastic deformation of the sley flange which occurs upon tightening of the pressure screws.

In use, as the pressure screws are tightened against the comb, e.g., against a foot portion of the comb, first one rim of the end face of the screw and finally the entire end face, comes into contact with the side face of the foot part. In this way, the pressing force of each screw becomes distributed uniformly over the entire cross-section of the end face and applied to the comb foot.

In the case of a loom sley having a recess defined by flanks which are preferably parallel, the axes of the pressure-screws are inclined toward the bottom of the recess at an angle of inclination amounting to at least 0.5°. The desired effect is thus obtained with advantageously low stress, both at the comb foot and also at the corresponding part of the sley profile.

In order to exactly maintain the angle of inclination of the screw-threaded holes during manufacture in a simple way, the flange which contains the pressure-screws has an outer face which is disposed perpendicularly to the screws axes and slanted at a corresponding angle of inclination. In this way, it is possible during the tightening-up of the screws to obtain the optimum braced position of the flange containing these screws by the eye alone. The correct position of the flange is reached when the previously slanted part of the outer surface becomes set parallel to the side face of the comb foot.

In another embodiment, the flange of the sley can be disposed on an angle to the recess for the comb while the screw threaded holes are disposed perpendicularly of the flange. Upon tightening of the pressure screws, the flange will deform into a position parallel to the recess and an opposed recess-defining part.

These and other objects and advantages of the invention will become more apparent from the following detailed description and appended claims taken in conjunction with the accompanying drawings in which:

FIG. 1 illustrates a loom sley having a comb fastened therein according to the invention;

FIG. 2 illustrates a side view taken in the direction of the arrow II of FIG. 1; and

FIG. 3 illustrates the loom sley in an unloaded state as viewed along the line III—III of FIG. 1.

Referring to FIG. 1, a loom (not shown) includes a sley 1 which is fastened on a number of sley levers 2 by means of screws 3 and extends substantially over the entire width of the loom. The sley levers 2, of which only two are shown, are mounted on a shaft (not shown) connected to the loom drive and are driven so as to impart pivoting movements to the sley 1 as shown by the arrows 10 (FIG. 2).

Referring to FIG. 3, the sley 1 is approximately U-shaped in profile, and includes two flanges 6, 7 which define a continuous groove-like recess 5 along the entire length of the sley 1 by means of parallel flanks 8, 9. The sley profile serves for the attachment of a comb 11, which is provided with a foot part 12 that can be introduced into the recess 5. The side walls of this foot part 12 are parallel to the corresponding flanks 8, 9 of the sley 1. The comb 11, as is known, comprises a frame formed of two horizontal tubes 13, 14, side struts 15 connecting the tubes 13, 14 together and fastened to the foot part 12, and a number of comb-rods 16 fastened to the tubes 13, 14.

When the loom is in operative condition, warp threads pass between the comb-rods 16 which are distributed across the width of the loom. During the operation of the loom, these threads are divided in known manner so as to form a shed, in which, at each operative cycle of the loom, a weft thread passes. After each pass or shot, the comb 11 is beaten against the apex of the shed by means of a pivoting motion of the sley 1 in the direction of the arrow 10 of FIG. 2, in order to carry the weft threads to the woven fabric being formed thereat. After each change of shed, the comb 11 swings back, a new weft thread is inserted, and is beaten up by another pivoting movement of the comb 11.

The flange 7 of the sley 1 is provided with a number of uniformly spaced screw-threaded holes, whose axes 17 (FIG. 3) are each inclined at an angle α of approximately 1° relative to an imaginary perpendicular to the flank 9, or to the side wall of the comb foot 12 facing the flank 9. This inclination is directed toward the bottom of the recess 5. The angle α is, for the sake of clarity, exaggerated in FIG. 3. The outer face 21 of the flange 7 is bevelled, or slanted, in the region of the screw-threaded holes to correspond to the angle of inclination α, so as to be situated perpendicular to the axes 17.

In order to fasten the comb foot 12 in the recess 5, a pressure-screw 18 is disposed in each screw-threaded hole. Each screw 18 has one end which passes into the recess 5 and contains a flat end face while the other end is provided with an internal hexagonal recess 19. In addition, a pressure plate 20 is disposed between the comb foot 12 and the screws 18 and extends continuously over the entire length of the comb 12 in order to prevent damage to the side wall of the foot 12 by the screws 18.

By means of a wrench inserted into the internal hexagonal recess 19, preferably a wrench having a maximum torque device, the pressure-screw 18 is turned and clamped against the foot 12 or pressure plate 20. Because of the angle of inclination α, the upper rim of the end face of the pressure-screw 18 first comes into contact with the pressure plate 20 (FIG. 3). During the further tightening-up of the pressure-screw 18, the flange 7 bends so that the sley profile becomes widened until, when the specified torque is reached, the flank 9 assumes the position shown in FIG. 2 in the position 9' inclined relative to the pressure plate 20, and formerly

inclined outer face **21** is now set approximately parallel to the side face of the comb foot **12**. In this position, the entire end face of the pressure-screw **18** bears against the pressure plate **20**. As a result, the pressure forces are transmitted uniformly across the screw-section and are applied to the comb foot **12**.

It is noted that the pressure plate **20** not only serves to prevent penetration of the screws **18** into the comb foot **12** but also increases the surface available for applying the force so that the area pressure is certainly kept below the allowable limit. Further, as the end face of each pressure screw **18** bears flat against an abutment on the comb **12**, the screws **18** cannot, in practice, become loosened, for example, through a vibration occurring during operation of the loom. That is, the elastically deformed flange **7** forms a kind of lock for the screws and presses the screws **18** particularly tightly against the pressure plate **20** in the optimum position for transmitting the force of application. In this way, the attachment of the comb foot **12** is substantially improved in comparison with earlier designs.

It is self-evident that the angle of inclination α can be of varying magnitude, depending on the material and the shape of the sley profile. For example, angles of greater than 1° are needed in the case of a slim sley profile of light metal. An angle of inclination of less than about 0.5° on the other hand does not have much sense, because such an angle would, under certain conditions lie within allowable machining tolerances, so that the contemplated effect could not be obtained.

The canted position of the pressure-screws relative to the comb foot can also be obtained in other ways. For example, the sley profile may have a recess whose flanks are not parallel, whereby the flange containing the screws is situated at an angle. In this case, the screw-threaded holes can be situated perpendicular to the flank. Upon tightening the screws, the flange likewise becomes elastically deformed and is finally brought up into a position in which the flanks are parallel, and the screws bear by their entire cross-section against the surface contacted on the comb.

What is claimed is:

1. A loom sley having a comb receiving groove therein and a flange defining a part of said groove, said flange having at least one screw threaded hole therein disposed on an axis inclined at an angle from a perpendicular plane to a contact surface of a comb to be received in said groove, said angle having a magnitude corresponding to a predetermined elastic deformation of said flange, said angle being directed opposite to the direction of deformation of said flange.

2. A loom sley as set forth in claim **1** wherein said flange has a first flank thereon and said sley has a second flank opposite said first flank to define said groove.

3. A loom sley as set forth in claim **1** wherein said flanks are disposed in parallel relation and each said screw threaded hole is disposed on an axis inclined with respect to a perpendicular plane to said first flank.

4. A loom sley as set forth in claim **1** wherein said first flank is inclined with respect to said second flank and each said screw threaded hole is disposed on an axis perpendicular to said first flank.

5. A loom sley as set forth in claim **1** further including a pressure screw mounted in said hole and having a flat end face at one end for abutting a contact surface on a comb foot received in said groove.

6. A loom sley as set forth in claim **1** wherein said flange has an outer surface disposed in perpendicular relation to said axis of said screw hole.

7. A loom sley having a comb receiving groove therein and a flange defining a part of said groove, said flange having at least one screw threaded hole therein disposed on an axis inclined at an angle of at least 0.5° from a perpendicular plane to a contact surface of a comb to be received in said groove.

8. In combination,

a loom sley having a pair of flanges defining a recess therein, one of said flanges having a side wall in said recess;

a comb having a foot portion disposed in said recess between said flanges; and

at least one pressure screw passing through one of said flanges and having a flat end face in contact with said comb foot portion across the entire surface of said flat end face, said screw being disposed in an angular relation from a perpendicular plane to said side wall of said one flange and said one flange being elastically deformed away from said comb with said screw in full bearing contact with said comb foot.

9. The combination as set forth in claim **8** which further includes a pressure plate between said foot portion and said screw extending over the length of said comb.

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