Aug. 14, 1951 J. RINNE ET AL 2,564,343

MECHANISM FOR MAINTAINING CLOTH IN CONTACT WITH TAKE-UP ROLL

Original Filed April 12, 1947 3 Sheets-Sheet 1

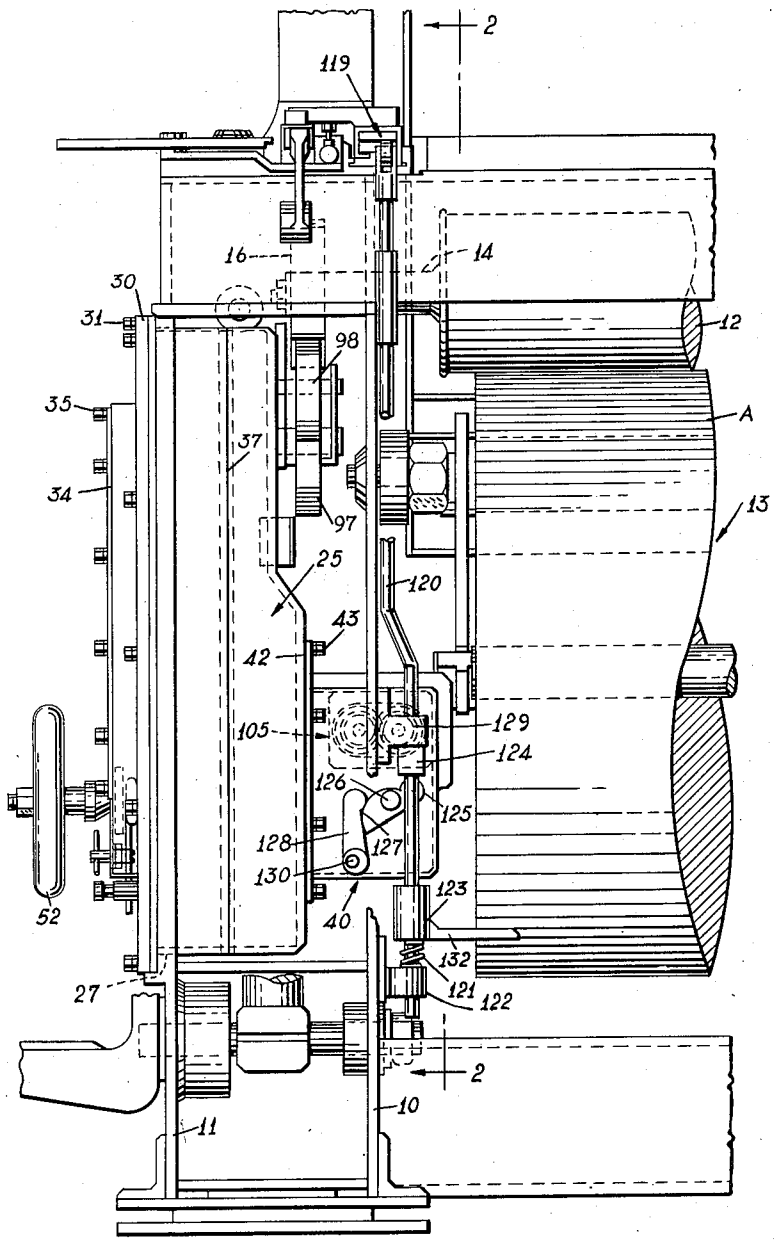


Fig. 1

INVENTORS.
JOHN RINNE
EVERETT H. ASHTON
ROBERT G. MALLARD
FRANCIS GERARD LAKE
BY Virgil F. Davis
ATTORNEY

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Original Filed April 12, 1947 3 Sheets-Sheet 2

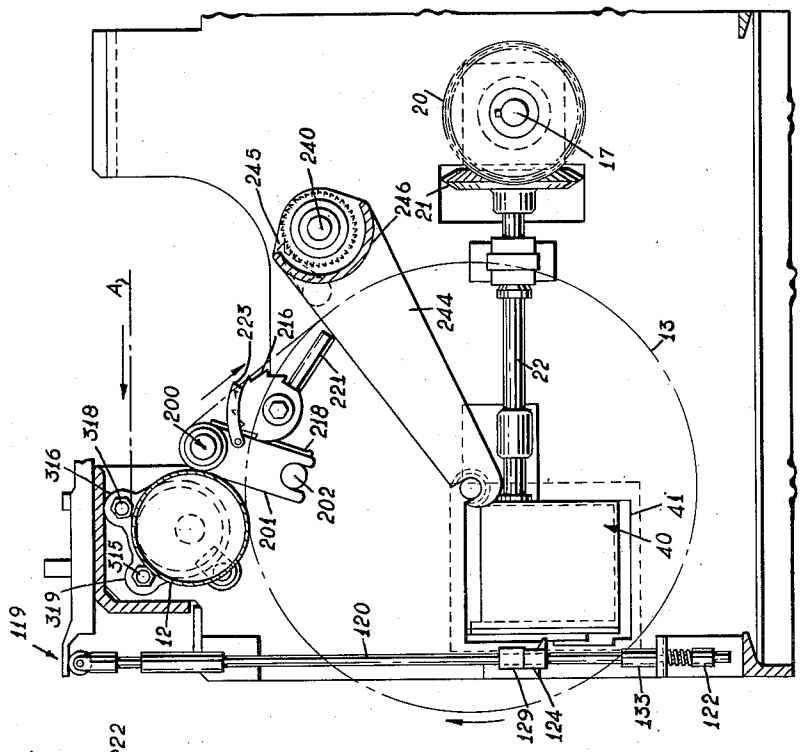


Fig. 2

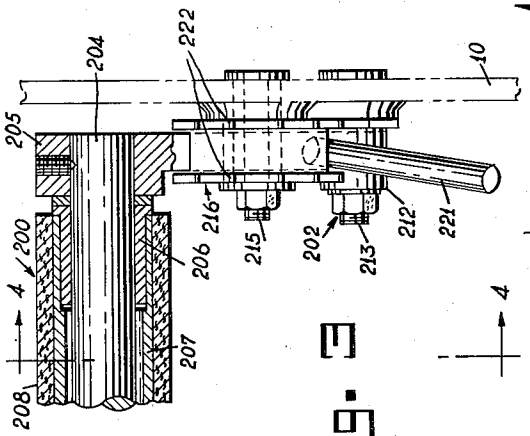
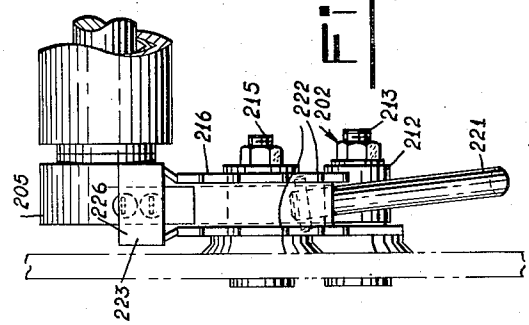


Fig. 3



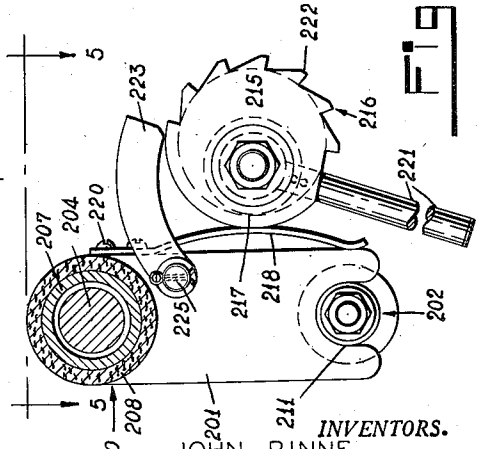


Fig. 4

INVENTORS.
JOHN RINNE
EVERETT H. ASHTON
ROBERT G. MALLARD
FRANCIS GERARD LAKE
BY Virgil F. Darico
ATTORNEY

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Original Filed April 12, 1947 3 Sheets-Sheet 3

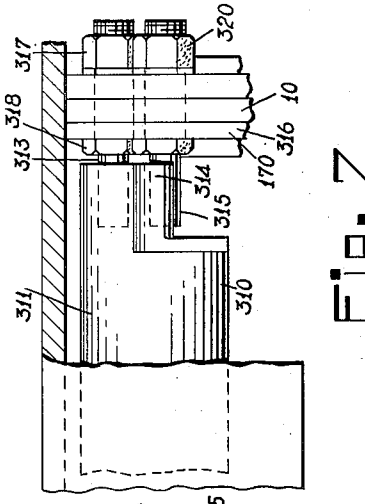


Fig. 7

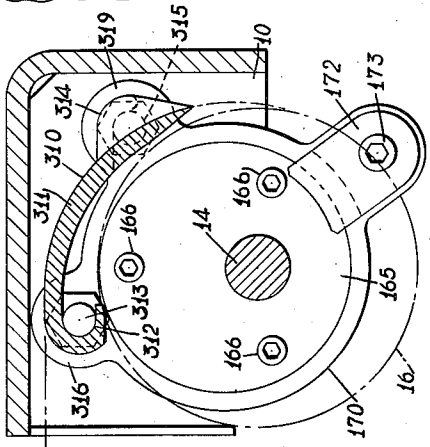


Fig. 6

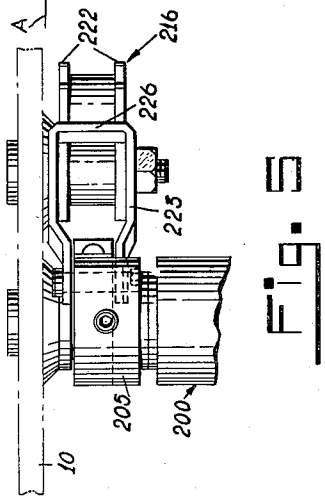


Fig. 5

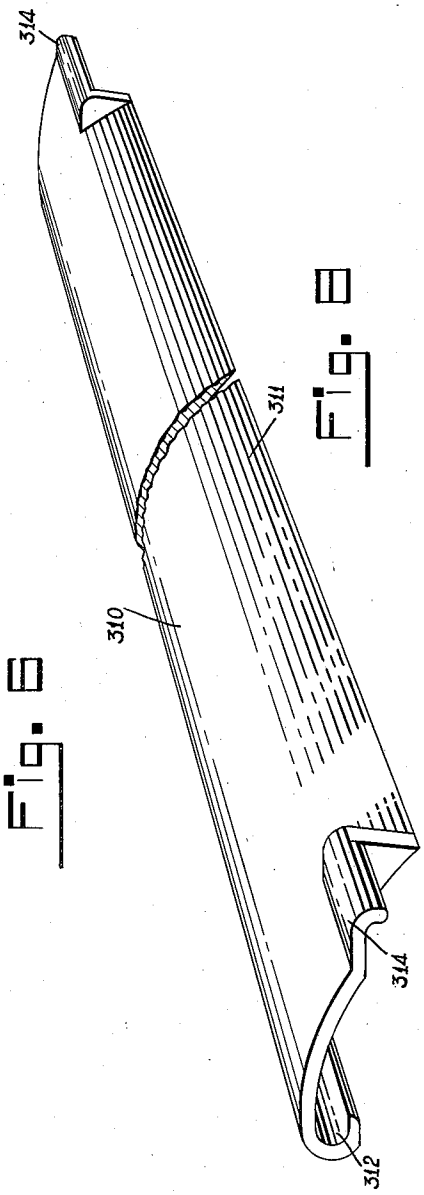


Fig. 8

INVENTORS.
JOHN RINNE
EVERETT H. ASHTON
ROBERT G. MALLARD
FRANCIS GERARD LAKE
BY Virgil F. Davico
ATTORNEY

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UNITED STATES PATENT OFFICE

2,564,343

MECHANISM FOR MAINTAINING CLOTH IN CONTACT WITH TAKE-UP ROLL

John Rinne, Staten Island, N. Y., and Everett H. Ashton, Allston, and Robert G. Mallard, Hopedale, Mass., and Francis Gerard Lake, New York, N. Y., assignors, by mesne assignments, to Steel and Alloy Tank Company, Newark, N. J., a corporation of New Jersey

Original application April 2, 1947, Serial No. 139,004, now Patent No. 2,518,185, dated August 8, 1950. Divided and this application February 3, 1950, Serial No. 142,202

8 Claims. (Cl. 139—308)

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The present invention relates to a cloth roll take-up mechanism for looms and is a division of application Serial No. 739,004, now Patent No. 2,518,185, filed April 2, 1947.

In the usual take-up mechanism, the cloth passes around a take-up roll having a friction surface serving to engage and advance the cloth towards a cloth roll rotated by the friction driving action of the take-up roll.

An important object of the present invention is to provide new and improved easily releasable means for firmly maintaining the cloth in friction feeding contact with the take-up roll under controllable pressures, and for maintaining said cloth in pressure contact with said take-up roll even when the cloth roll is lowered out of friction driving contact with said take-up roll.

In the usual loom, the cloth is alternately crinkled and straightened over the take-up roll due to beat-up actions. This causes the cloth to scrape over the upper rough surface of the take-up roll, and with certain type fabrics this action injures the cloth.

Another object of the present invention is to provide a new and improved cloth protecting means which guides the cloth over the upper section of and away from the take-up roll, to avoid the abrasive action of said take-up roll section during the beat-up action, which is simple and inexpensive to manufacture, and which can be easily and expeditiously attached in operative position with respect to the take-up roll or easily demounted.

Various other objects of the invention will be apparent from the following particular description, and from an inspection of the accompanying drawings, in which:

Fig. 1 is a front view of the left-hand side of a loom embodying the features of the present invention, certain parts of said loom not related to the present invention being absent from the view for the purpose of clarity;

Fig. 2 is a section of the loom taken approximately along the lines 2—2 of Fig. 1, but showing mainly the pressure take-up roll structure, the cloth roll structure and the drive input end of the take-up gear transmission.

Fig. 3 is a plan view partly in section of the pressure roll structure;

Fig. 4 is a section of the pressure take-up roll structure taken approximately along the lines 4—4 of Fig. 3.

Fig. 5 is a top plan view of the pressure take-up roll structure shown in Fig. 4;

Fig. 6 shows an end view of the take-up roll

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structure with a chafing guard attachment to prevent abrasion of the cloth due to beat-up movements of the cloth over the take-up roll;

Fig. 7 is a front view of the part of the take-up roll structure with the chafing guard attachment; and

Fig. 8 is a perspective of the chafing guard attachment.

Referring to the drawings, and especially to Fig. 1, the loom frame may be of the conventional type, but is desirably of the improved form shown in copending application, Serial No. 691,237, filed August 17, 1946, now Patent No. 2,533,128. In this improved type of loom, instead of the conventional loomsides, each with a single frame web, each loomside comprises a pair of parallel webs 10 and 11 rigidly interconnected by suitable girts and bracing members.

Mounted near the front section of the loom is the take-up motion comprising a take-up roll 12 supported on the loomsides and covered with sandpaper or similar rough surfaced material adapted to frictionally grip the cloth A after it is formed and advance it towards the cloth roll 13. The cloth roll 13 is pressed into contact with the take-up roll 12 in the manner to be described, and is frictionally driven thereby to wind the cloth around said roll 13.

The take-up roll 12 has secured to the ends thereof gudgeons 14 journalled in suitable bearings on the inside frame webs 10. One of the gudgeons 14 on the left-hand loomside has secured thereto between the two frame webs 10 and 11 (Fig. 1) a gear 16 by which the take-up roll 12 is continuously driven as the cloth is formed. The take-up roll gear 16 is driven from the crank shaft of the loom (not shown), which extends parallel to the axis of the take-up roll 12, and which drives through a pair of intermeshing gears not shown) a short pick cam shaft 17, below said crank shaft on the left-hand side of the loom. On the pick cam shaft 17 is connected a bevel gear 20 meshing with a bevel gear 21 on a drive shaft 22. Between the drive shaft 22 and the take-up roll gear 16, is a take-up gear transmission.

The take-up gear transmission is mounted in a box or casing 25 extending through an opening in the outer frame web 11. The gear box 25 has a mounting flange 30 abutting the outer face of the frame web 11 around the web frame opening 27, and is closed at its left-hand side by a plate wall secured to said flange 30 and to said frame web 11 by means of screw studs 31. Said plate wall is provided with a flanged opening closed by

a removable cover plate 34 supported in position by means of screw studs 35. The cover plate 34 is in readily accessible position and can be removed to permit access to the interior of the gear box 25, as for example, for the purpose of changing the speed ratio according to the desired pick. The cover plate 34 is desirably of transparent material to serve as a window, so that the interior of the gear box 25 can be easily observed.

On the right-hand side of the gear box 25 is an extension 40 passing through an opening 41 in the inner frame web 10, and having a mounting flange 42 by which said gear box extension is secured to the gear box wall by means of screw studs 43. The drive shaft 22 passes through the rear wall of the gear box extension 40, is journalled in bearings in said rear wall.

The construction and arrangement of the take-up gear transmission will not be gone into here as they are not the basis of the claims of this application and are fully disclosed in said parent application Serial No. 739,004, now Patent No. 2,518,185.

The take-up gear transmission includes the drive gear 97 which meshes with idler gear 98, which in turn meshes with the take-up roll gear 16.

As a feature of the present invention, means are provided for maintaining the cloth A in controllable pressure friction gripping contact with the periphery of the take-up roll 12, to afford effective advancement of said cloth towards the cloth roll 13. This pressure means is shown particularly in Figs. 2, 3, 4 and 5, and comprises a pressure roll 200 extending in front of the take-up roll 12 and along substantially the full length thereof, and supported at its ends in a pair of upright arms 201 mounted at their lower ends in pivots 202 secured to the inner sides of the inside frame webs 10 respectively. The pressure roll 200 comprises an axle 204, to the ends of which are set-screwed the hubs 205 of the arms 201. Supported on the ends of the axle 204 for free rotation thereabout are bushings 206 rigidly interconnected by a cylindrical shell 207, which in conjunction with the bushings 206 is free to rotate about said axle. Around the cylindrical shell 207 is a covering 208 of felt or similar soft friction material, adapted to engage the cloth A as it passes around the take-up roll 12, and presses said cloth against said roll.

Each arm 201 is provided at its lower end with a notch 211 adapted to receive the corresponding pivot 202 with a rotative conforming fit, so that the pressure roll 200 can be adjusted angularly about its supporting pivots 202 towards and away from the periphery of the take-up roll 12. Each pivot 202 comprises a sleeve 212 supported on a bolt 213 fastened to the corresponding frame web 10.

To press the pressure roll 200 against the take-up roll 12 to a controllable extent, there is mounted on the inner side of each inside frame web 10 a cam 216 supported on an axle bolt 215 secured to said frame web. The cam 216 has a cam surface 217 on one side bearing against a bowed leaf spring 218 secured at one end by screws 220 to one edge of the corresponding arm 201. The cam surface 217 has a diameter which increases progressively in a clockwise direction (Fig. 4). Therefore, as the cam 216 is rotated counterclockwise (Fig. 4), the spring 218 is pressed to the left with progressively increasing force, and this, in turn, urges the pressure roll 200 against the take-up roll 12 with corresponding pressure. Each of the cams 216 may be rotated through a handle 221 secured thereto.

To retain the cam 216 in adjusted rotated position, each cam 216 has a series of ratchet teeth 222 on each side thereof and a pawl 223 is provided which idles over said teeth as the cam is rotated counterclockwise (Fig. 4), but which engages said teeth and holds thereby said cam against clockwise rotation tending to release the pressure of said cam against the spring 218. The pawl 223 is shown in the form of a yoke straddling at its open end the corresponding roll supporting arm 201, and pivotally secured at said end to said arm for free swinging movement by means of a pivot pin 225. The pawl 223 rests on the upper section of the cam 216, and as the cam 216 is rotated counterclockwise (Fig. 4), the teeth 222 ride idly past the crossbar 226 at the outer closed end of said pawl. Clockwise rotation of the cam 216 is prevented by the catch engagement of the pawl crossbar 226 with the ratchet teeth 222 on said cam.

The cloth A passes around approximately three-quarters of the periphery of the take-up roll 12, passes over the freely rotatable pressure roll 200, and is then wound around the cloth roll 13. The pressure roll 200 thereby serves not only as a means for pressing the cloth against the friction gripping surface of the take-up roll 12, but also as a guide for the cloth in its passage towards the cloth roll 13.

The full cloth roll 13 may be lowered out of drive engagement with the take-up roll 12, and the cloth cut off, to permit said cloth roll to be removed from the loom without moving the pressure roll 200 out of contact with said take-up roll. The cloth will therefore remain threaded in position around the takeup roll 12 while a new empty cloth roll is being set up on the loom; thus the cloth roll 13 may be removed while the loom is running.

The cloth roll 13 is maintained in friction drive contact with the lower section of the take-up roll 12 to rotate said cloth roll at the speed necessary to wind the cloth therearound. For supporting the cloth roll 13 in a manner to compensate for the progressive increase in its diameter, as the cloth winding operation proceeds, there is provided a cloth roll support axle 240 mounted at its ends in bearings fixed to the inside frame webs 10. Supported on the axle 240 for angular movement thereabout is a cloth roll support frame comprising a pair of arms having respective hubs 245 embracing the axle 240 with a snug rotative fit, and rigidly interconnected by means of a cross frame piece 246. The details of means employed for supporting cloth roll 13 will not be gone into here as they are not the basis for the present claims and are fully disclosed in said parent application Serial No. 739,004, now Patent No. 2,518,185.

As the cloth A passes around the take-up roll 12, the beat-up action of the reed causes said cloth alternately to crinkle and straighten on the top of said take-up roll, so that the cloth is subjected to the abrasive action of the rough surface on said take-up roll. This rubbing action is detrimental to some types of cloth, and is especially prominent and undesirable in the type of full cover fine count cloth which is formed with the take-up roll 12 in its highest adjusted position. To avoid this abrasive action there is provided a chafing guard 310 presenting a smooth surface 311, and serving to guide the cloth along said surface and over the top of the take-up

roll 12 towards the side of said roll where there is little or no crinkling action.

The guard 310 is in the form of a plate extending substantially the full length of the take-up roll 12 and having its rear edge section reversely curved to form a channel 312 adapted to be hooked on to studs 313 secured to the two inside frame webs 10 substantially parallel to the take-up roll 12. At its forward edge, the guard 310 is provided at each end with a catch 314 adapted to seat on studs 315 secured in a similar manner to the inside frame webs 10. In the example shown the studs 313 and 315 conveniently pass through ears 316 and 319 in a shim plate 170 which forms part of a bearing assembly for the trunnions of the take-up roll 12. Said bearing assembly is completely described in said parent application Serial No. 739,004, now Patent No. 2,518,185. Said studs 313 and 315 are held in position on frame webs 10 by nuts 318, 317 and 320.

The guard 310 may be expeditiously mounted in operative position shown by a simple manipulation, and may be just as easily and expeditiously removed. Since the guard 310 is mounted above the take-up roll 12, this guard determines the highest position of the cloth. In Fig. 6, the guarded take-up roll 12 is shown in its lower adjusted position, while the cloth passing over said guard is in its highest position to produce a cloth with a full appearance or cover.

As many changes can be made in the above apparatus, and many apparently widely different embodiments of this invention can be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In a take-up mechanism for a loom, a take-up roll, a pressure member extending along said take-up roll, and cam means for forcing said pressure member towards said take-up roll in its passage from said take-up roll to a cloth roll, said cam means being adjustable to control selectively the pressure of said pressure member against said take-up roll.

2. In a take-up mechanism for a loom, a take-up roll, a pressure member extending along said take-up roll, means supporting said pressure member for movement towards and away from said take-up roll, and means for forcing said pressure member towards said take-up roll to press the advancing cloth against said take-up roll in its passage from said take-up roll to a cloth roll, and comprising a cam bearing against an element secured to said pressure member and adjustably rotatable to vary the force of said cam against said element, and means for locking said cam in adjusted position against rotation in a direction tending to release the force of said cam against said element.

3. In a take-up mechanism for a loom, a take-up roll, a pressure member extending along said take-up roll, means supporting said pressure member for movement towards and away from said take-up roll, means for forcing said pressure member towards said take-up roll to press the advancing cloth against said take-up roll in its passage from said take-up roll to a cloth roll, and spring means between said forcing means and said pressure member to transmit yieldably the force from said forcing means to said pressure member.

4. In a take-up mechanism for a loom, a take-up roll, a pressure member extending along said take-up roll, a pair of arms secured to said pressure member and supporting said pressure member for movement towards and away from said take-up roll, a cam bearing against the edge of each of said arms, and adjustably rotatable to vary the force of said cam against said arm, a set of ratchet teeth rigid with each of said cams for rotation therewith, and a pawl cooperating with said set of ratchet teeth to lock its corresponding cam in adjusted position against rotation in a direction tending to release the force of said cam against said arms.

5. In a take-up mechanism for a loom, the combination as describd in claim 4, in which said arms are pivotally supported for angular movement, and each of said arms carries a bowed leaf spring against which the corresponding cam bears.

6. In a take-up mechanism for a loom, a take-up roll, a pair of members extending substantially parallel to the axis of said take-up roll near the upper side of said take-up roll, and disposed one in front of the other, and a chafing guard detachably supported on said members in position to guide the cloth over and away from the upper surface of said take-up roll and towards the side of said take-up roll.

7. In a take-up mechanism for a loom, a take-up roll, a rod extending substantially parallel to the axis of said take-up roll near the upper side of said take-up roll, rod means disposed near the upper side of said take-up roll in front of said rod, and a chafing guard plate having its rear edge reversely curved to form a channel for detachably receiving the rear rod and having catch means near its front edge removably seated on said front rod means.

8. In a take-up mechanism for a loom, the combination as described in claim 7, in which said rear rod is fastened to fixed frame parts of the loom and extends substantially along the full length of said take-up roll, the front rod means comprises a pair of axially aligned studs fastened to fixed frame parts of the loom near the ends of said take-up roll, and said catch means comprises catch members in the front edge of said guard plate near the respective ends thereof.

JOHN RINNE.
EVERETT H. ASHTON.
ROBERT G. MALLARD.
FRANCIS GERARD LAKE.

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