March 18, 1952 A. E. ZABRISKIE ET AL 2,589,524

CLOTH ROLL CONTROL MECHANISM

Filed Sept. 24, 1948 2 SHEETS—SHEET 1

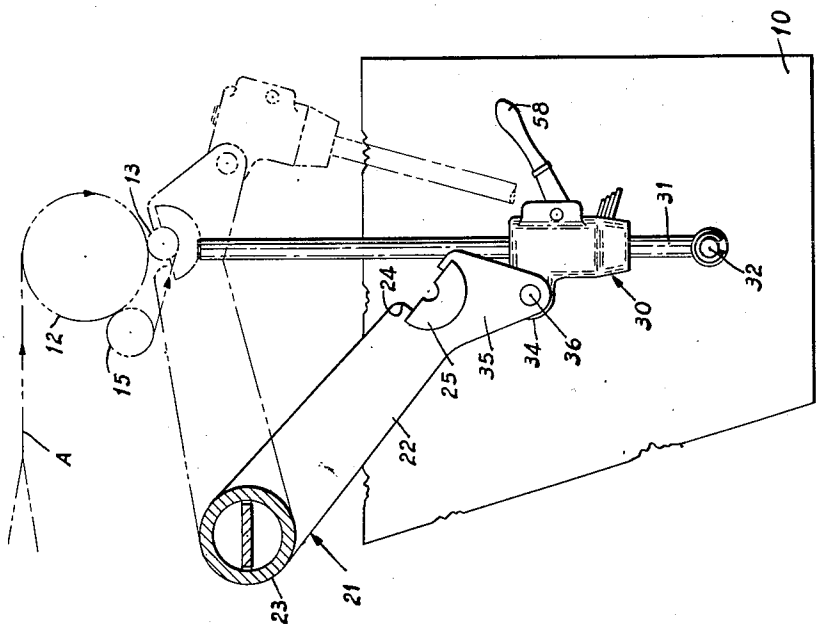


Fig. 2

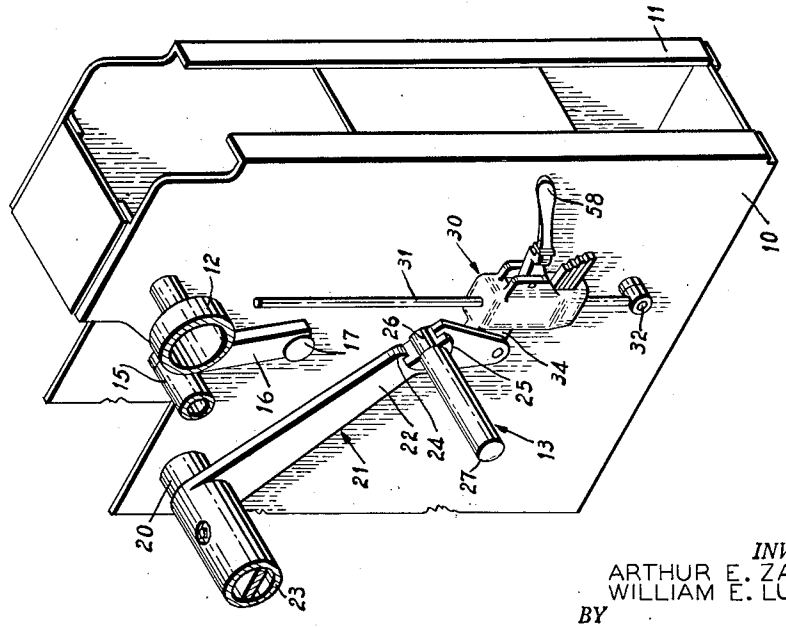


Fig. 1

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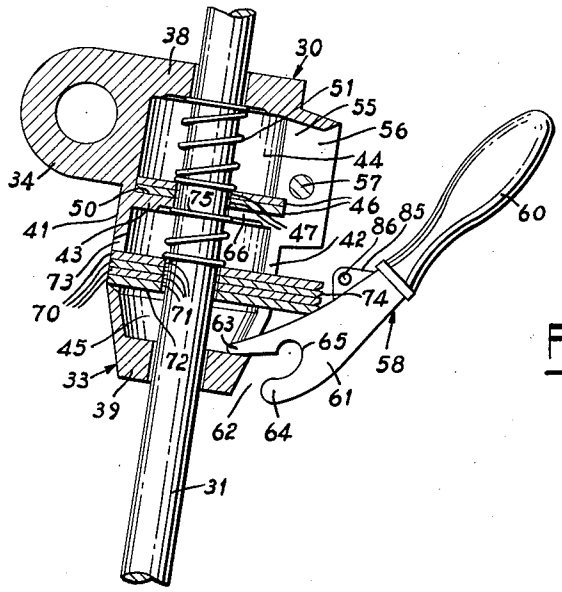


Fig. 5

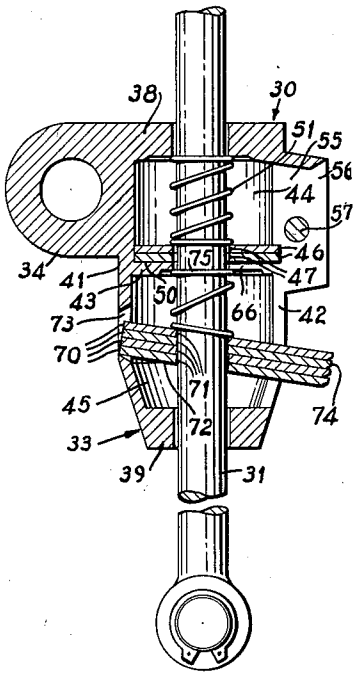


Fig. 3

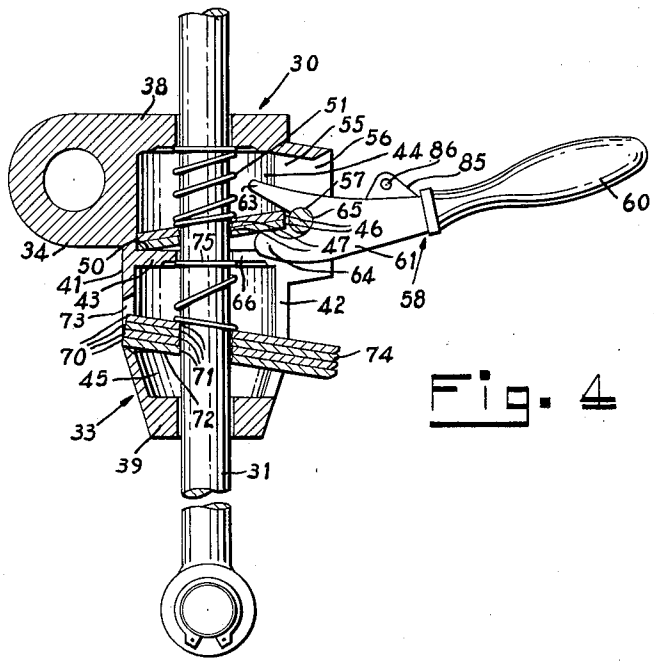


Fig. 4

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2,589,524

CLOTH ROLL CONTROL MECHANISM

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Application September 24, 1948, Serial No. 50,932

10 Claims. (Cl. 139—308)

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The present invention relates to a loom apparatus for controlling the movement of a cloth roll towards or away from drive engagement with respect to a take-up roll.

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.

One object of the present invention is to provide a new and improved cloth roll control means, which permits automatic lowering of the cloth roll axis as the diameter of said roll increases, while maintaining said roll in friction drive contact with the take-up roll, which can be manipulated to lock the cloth roll in selective position with respect to the take-up roll to permit a full cloth roll to be easily removed from the cloth roll support means and an empty cloth roll to be easily mounted thereon, and which can be manipulated to permit controlled movement of the cloth roll towards drive relationship with respect to said take-up roll.

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

Fig. 1 is a perspective of the forward portion of the ring-hand loomside showing a cloth roll supporting means with the associated cloth roll control means embodying the present invention;

Fig. 2 is a section of the right-hand loomside looking outwardly and showing in full lines the cloth roll supporting means in lowered position and showing in dot and dash lines, the cloth roll supporting means elevated in position to begin the cloth winding operations;

Fig. 3 is a vertical view, partly in section, taken through the device for controlling the movement of the cloth roll towards or away from the take-up roll and showing said device during cloth winding operations;

Fig. 4 is a vertical view, partly in section, taken through the device for controlling the movement of the cloth roll towards or away from the take-up roll and showing said device manipulated into condition to permit said roll to be controllably lowered by hand;

Fig. 5 is a vertical view, partly in section, taken through the device for controlling the movement of the cloth roll towards or away from the take-up roll and showing said device manipulated into condition to permit said roll to be controllably raised by spring action into cloth winding position.

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Although the invention may be applied to a loom having a conventional type of frame structure with single web loomsides, it is shown in Figs. 1 and 2 applied to a loom having a frame structure of the improved form disclosed in copending application, Serial No. 691,237, filed August 17, 1946, now Patent No. 2,533,128. In this improved type of frame structure, each loomside comprises a pair of parallel webs 10 and 11 rigidly interconnected by suitable bracing members. Although the right loomside alone is shown in Figs. 1 and 2, it should be understood that the left loomside is of similar double web construction.

Mounted near the front section of the loom is a take-up roll 12 supported on the loomsides and driven from the take-up motion (not shown) of the loom. The take-up roll 12 is covered with sandpaper or similar roughly surfaced material to grip frictionally the cloth A after it is formed and to advance it towards a cloth roll 13. The cloth roll 13 is spring-pressed into contact with the take-up roll 12 and is frictionally driven thereby to wind the cloth around said roll 13.

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, for example, may comprise generally a pressure roll 15 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 16 slotted at their lower ends and supported at these ends on pivots 17 secured to the inner sides of the inside frame webs 10 respectively. Around the pressure roll 15 is a covering of felt or similar soft friction material adapted to engage the cloth as it passes around the take-up roll 12 and to press said cloth against said roll. The pressure roll 15 is pressed against the take-up roll 12 to a controllable extent, as for example, by cam means which are not shown herein.

The cloth A passes around approximately three-quarters of the periphery of the take-up roll 12, passes over the freely rotatable pressure roll 15 and is then wound around the cloth roll 13. The pressure roll 15 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 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 pair of coaxial pivots 20, for a cloth roll support frame 21, secured to the loomsides 10, 11. The cloth roll support frame 21 comprises a pair of arms 22 having an interconnecting hub 23 embracing the pivots 20 with a snug bearing fit. The outer roll supporting ends of each arm 22 is provided with a notch 24 lined with an open semi-cylindrical bearing 25 for receiving the gudgeon 26 of a cloth roll shaft 27. The cloth roll shaft 27 is thereby free to rotate in the cloth roll support arms 22 and is rotated by the friction drive engagement of the take-up roll 12.

The cloth roll support arms 22 are urged angularly upwardly about the pivots 20, to maintain the cloth roll 13 in frictional contact with the take-up roll 12 under yieldable spring pressure. For that purpose, there may be provided a torsion bar or flat spring in hub 23 with one end affixed to said hub and the other end anchored to a corresponding pivot 20. This spring is torsionally stressed, to urge the cloth support arms 22 counterclockwise. The cloth roll support structure and its mode of operation is described in detail in copending application Serial No. 50,933 filed Sept. 24, 1948, now Patent No. 2,510,454.

The structure so far described, forms per se, no part of the present invention and may be generally, as shown, or may be of any suitable construction. The feature of the present invention resides mainly in the brake means controllable for holding the cloth roll 13 in selective position with respect to the take-up roll 12 and for controlling the ascent of an empty cloth roll towards friction drive relationship with said take-up roll and in the combination of said brake means with the cloth roll support means. This brake means comprises a brake unit 30 slidable along an upright holding rod 31 pivotally mounted at its lower end 32 to the inner side of the frame web 10 on either loomside but desirably on the right-hand loomside. The brake unit 30 has a casing or frame 33 provided with a lug 34. The cloth roll support arm 22 nearest to the right-hand loomside has an offset extension 35 pivotally secured at 36 to said lug 34. As said cloth roll support arm 22 moves angularly about the pivots 20, the brake unit 30 moves along the holding rod 31, while said rod turns about its lower pivot support at 32.

The casing or frame 33 of the brake unit 30 has end walls 38 and 39 through which the rod 31 passes with a loose slide fit, opposite side walls 41 and 42 and an intermediate internal partition wall 43 dividing the interior of said casing into two superposed compartments 44 and 45. Disposed in the upper compartment 44 and resting on the partition wall 43 is a series of thin stacked brake plates 46 (two being shown) provided with aligned holes 47 through which the rod 31 passes with a loose slide fit. The holes 47 are either round and slightly larger in diameter than the diameter of the rod 31 passing therethrough or are slightly elongated horizontally in the section plane of Fig. 3.

The partition wall 43 has its upper surface 50 extending in a plane at right angles to the longitudinal axis of the rod 31, so that the brake plates 46 when resting thereon will extend in

planes at right angles to said rod axis. In this position of the plates 46, the holes 47 therein will be so located with respect to the rod 31 as to permit the brake unit 30 to move freely along said rod without interference from said plates. A coil spring 51 located in the upper compartment 44 and encircling the rod 31 bears at one end against the upper end casing wall 38 and at its other end against the stack of plates 46, thereby urging said plates against the partition wall 43. The coil spring 51 preferably has widely spaced coils to permit tilting of the plates 46 through comparatively wide angles into braking position with respect to the rod 31. By using a stack of two or more plates 46, instead of a single plate of heavier thickness a firmer braking grip is assured.

The casing or frame 33 of the brake unit 30 has a slot 55 extending substantially along the full length of its forward side wall 42 and a pair of opposed forwardly projecting guide flanges 56 on opposite sides of the upper section of said slot. Extending between these flanges 56 and secured thereto is a prop-pin 57 adapted to removably engage a removable hand-lever 58 by which the brake unit 30 may be manually controlled as will be explained hereinafter.

The removable lever 58 has a handle section 60 and a force applying section 61 provided with a slot 62 defining a pair of fingers 63 and 64 on opposite sides of said slot. The slot 62 has its base 65 notched and shaped to catch onto and retain the pin 57 therein when lever 68 is rotated about pin 57. The lever 58 is desirably provided with a lug 85, provided with a hole 86, to permit said lever to be suspended on a hook or pin in an easily accessible position on or near the loom.

The partition wall 43 is provided on the forward side of the rod 31 with a slot 66 through which the lever finger 64 is adapted to pass freely to engage the underside of the bottom plate 46, when the lever 58 is turned angularly clockwise about the pin 57, into position shown in Fig. 4.

A second set of brake-shoe plates 70 (four being shown) are provided in the compartment 45 with aligned holes 71 through which the rod 31 passes with a loose slide fit. The holes 71 are similar to the holes 47 of the plates 46, so that the plates 70 are permitted to move along the rod 31 when said plates extend in planes substantially at right angles to the longitudinal axis of the rod 31, Fig. 5, and bind onto said rod when tilted in the position shown in Figs. 3 and 4. The plates 70 have one side 72 extending into an opening 73 in the casing wall 41 and have the other side 74 projecting through the slot 55 of the opposite wall 42 and outwardly from the casing 33. A coil spring 75 encircling the rod 31 bears at one end against the partition wall 43 and at the other end against the top plate 70. Since the sides 72 of the plates 70 are supported on the lower edge of the wall opening 73 and since the opposite sides 74 have no similar support, said plates will be normally tilted with respect to the axis of the rod 31 by the action of the spring 75 thereon. In this tilted position, the plates 70 grip the rod 31, so that the brake unit 30 is locked against upward movement along said rod. By providing a number of thin plates 70 instead of a single plate of the same aggregate thickness, the gripping action of said plates is made more effective.

The components of the brake unit 30 are normally in the positions shown in Fig. 3, that is,

due to the action of the spring 51 the plates 46 rest on the partition 43 while due to the action of the spring 75 the plates 70 are disposed at an angle to the partition 43 and engage the rod 31 with the bottom one of the plates 70 bearing on the bottom wall of the slot 73. In this position the plates 46 do not resist the movement of the brake unit 30 relative to the rod 31 in either direction; the plates 70 prevent upward movement of the brake unit 30 relative to the rod 31 but do not resist downward movement.

Assuming now that the cloth roll 13, the arms 22, the brake unit 30 and the rod 31 are in the broken line positions of Fig. 2 and that the loom is producing cloth which is being wound on the cloth roll 13. The arms 22 under the influence of the flat spring in the hub 23 constantly exert a force tending to urge the cloth roll 13 towards the take up roll 12. Since the brake unit 30 is pivoted to the end of one of the arms 22 the brake unit 30 will resist upward movement of the arms 22 and the cloth roll 13 as any tendency toward upward movement of arms 22 causes a firmer engagement of the plates 70 and the rod 31. As cloth is wound on the cloth roll 13 and the thickness of the cloth thereon increases a pressure is developed which tends to move the rolls 12 and 13 apart. Ultimately the pressure tending to separate the rolls 12 and 13 exceeds that extended through the arms 22 tending to bring the rolls together and the cloth roll 13 will move downward and away from take up roll 12. This downward movement moves the brake unit 30 downward on rod 31. Plates 70 do not prevent the downward movement of the brake unit 30 since in such downward movement the bearing point of the plates 70 is lowered and the plates 70 tend to move into a position of parallelism with the plates 46. Movement of the plates 70 into parallelism with plates 46 is restrained by the spring 75 so that in fact the plates 70 move upwardly relative to the brake unit 30 only enough to permit the rod 31 to move upwardly relative to the plates 70.

When sufficient cloth has been accumulated on the cloth roll 13 that its removal from the loom becomes desirable, the arms 22 and the cloth roll 13 must be lowered manually to permit the cloth roll 13 to freely pass the take up roll 12. To accomplish this, the lever 60 is inserted over pin 57 with tine 64 beneath the plates 46. The handle of the lever 60 is then moved downwardly about pin 57 to raise the plates 46 relative to the unit 30. As the plates 46 are raised they firmly engage rod 31 and lock thereto so that the downward movement of the handle of lever 60 results in a downward movement of the unit 30 relative to the rod 31. The handle of the lever 60 is then moved upward to return the plates 46, through the engagement therewith of the tine 63 and the action of spring 51, to their original position. No movement of the brake unit 30 takes place at this time since the plates 70 while they permit the downward movement of the brake unit 30 relative to the rod 31 prevent upward movement. The lowering and raising of the handle of lever 60 is repeated until the cloth roll 13 is lowered to the desired extent.

After the full cloth roll 13 has been removed and an empty cloth roll 13 has been put into its place, it becomes necessary to move the cloth roll support mechanism upwardly until the new cloth roll 13 engages the take up roll 12. To accomplish this end, the lever 60 is positioned with its tine 63 beneath the plates 70 and upon the bottom wall 39 of the brake unit 30. The handle of the lever 60 is then raised to bring the plates 70 into parallelism with the plates 46. With the plates 70 in this position the arms 22 raise the cloth roll 13, under the influence of the flat spring in the hub 23, until it engages the take up roll 12. The lever 60 is then removed and the spring 75 again moves the plates 70 into locking position on the rod 31.

While the invention has been described with particular reference to a specific embodiment, it is to be understood that it is not to be limited thereto but is to be construed broadly and restricted solely by the scope of the appended claims.

What is claimed is:

1. In a loom, a cloth roll, means for driving said cloth roll, means for supporting said cloth roll for movement along an arcuate path towards and away from said driving means and for urging said cloth roll towards said driving means along said path, a holding rod pivotally anchored to the frame structure of said loom, and a brake device pivotally connected to said supporting means and slidable along said rod as said cloth roll is moved along said path towards and away from said driving means, said brake device comprising releasable means for locking said device to said rod to prevent movement of said cloth roll towards said driving means while permitting movement of said cloth roll away from said driving means as the thickness of cloth on said cloth roll increases.

2. In a loom, a cloth roll, means for driving said cloth roll, means for supporting said cloth roll for movement along an arcuate path towards and away from said driving means and for urging said cloth roll towards said driving means along said path, a holding rod pivotally anchored to the frame structure of said loom, and a brake device pivotally connected to said supporting means and slidable along said rod as said cloth roll is moved along said path towards and away from said driving means, said brake device comprising releasable means for locking said device to said rod to prevent movement of said cloth roll towards said driving means while permitting movement of said cloth roll away from said driving means, and manually operatable means for releasing said brake to permit movement of said cloth roll towards said driving means.

3. In a loom, a cloth roll, means for driving said cloth roll, means for supporting said cloth roll for movement along an arcuate path towards and away from said driving means and for urging said cloth roll towards said driving means along said path, a holding rod pivotally anchored to the frame structure of said loom, and a brake device pivotally connected to said supporting means and slidable along said rod as said cloth roll is moved along said path towards and away from said driving means, said brake device comprising releasable means for locking said device to said rod to prevent movement of said cloth roll toward said driving means while permitting movement of said cloth roll away from said driving means, and a removable lever manipulatable to release said releasable means to permit movement of said cloth roll towards said driving means.

4. In a loom, the combination as described in claim 3, said brake device comprising a frame structure and a prop-pin on said frame structure, said lever having a notch for detachably engaging said prop-pin, said hand lever when engaging

said prop-pin being adapted to turn about said pin and to use said pin as a fulcrum.

5. In a loom, a cloth roll, means for driving said cloth roll, means for supporting said cloth roll for movement along an arcuate path towards and away from said driving means and for urging said cloth roll towards said driving means along said path, a holding rod pivotally anchored to the frame structure of said loom, and a brake device pivotally connected to said supporting means and slidable along said rod as said cloth roll is moved along said path towards and away from said driving means, said brake device comprising a brake-shoe normally in gripping engagement with said rod to lock said device to said rod to prevent movement of said cloth roll toward said driving means, and a removable lever operatable to move said brake-shoe out of gripping position to permit movement of said cloth roll towards said driving means.

6. In a loom, a cloth roll, means for driving said cloth roll, means for supporting said cloth roll for movement along an arcuate path towards and away from said driving means and for urging said cloth roll towards said driving means along said path, a holding rod pivotally anchored to the frame structure of said loom, and a brake device pivotally connected to said supporting means and slidable along said rod as said cloth roll is moved along said path towards and away from said driving means, said brake device comprising releasable means for locking said device to said rod to prevent movement of said cloth roll toward said driving means while permitting movement of said cloth roll away from said driving means, and manually actuable means for moving said brake device, and through said brake device said cloth roll, away from said driving means against the action of said supporting means.

7. In a loom, a cloth roll means for driving said cloth roll, means for supporting said cloth roll for movement along an arcuate path towards and away from said driving means and for resiliently urging said cloth roll towards said driving means along said path, a hand lever, and means pivotally connected to said supporting means and the loom frame including normally inoperative means for moving said cloth roll away from said driving means against the action of said supporting means, normally operative means for preventing movement of said cloth roll towards said driving means while permitting movement of said cloth roll away from said driving means, means for removably supporting said hand lever to actuate said normally inoperative means to move said cloth roll, and means for removably supporting said hand lever to actuate said normally operative means to render the same inoperative.

8. In a loom, a take-up roll, a cloth roll, a pair of arms suporting said cloth roll for angular movement towards and away from driven engagement with said take-up roll, said arms being spring-pressed towards said take-up roll, an upright holding rod pivotally secured at its lower end to a loomside and a brake device having a frame pivotally connected to one of said arms and slidable along said rod as said cloth roll is moved towards and away from said take-up roll, said brake device comprising manually releasable means for locking said device to said rod and for locking thereby said cloth roll against movement towards said take-up roll.

9. In a loom, a take-up roll, a cloth roll, a pair of arms supporting said cloth roll for angular movement towards and away from driven engagement with said take-up roll, said arms being spring-pressed towards said take-up roll, an upright holding rod pivotally secured at its lower end to a loomside, and a brake device having a frame pivotally connected to one of said arms and slidable along said rod as said cloth roll is moved towards and away from said take-up roll, said brake device comprising normally inoperative, manually operatable means for moving said cloth roll away from said take-up roll.

10. In a loom, a take-up roll, a cloth roll, a pair of arms supporting said cloth roll for angular movement towards and away from driven engagement with said take-up roll, said arms being spring-pressed towards said take-up roll, an upright holding rod pivotally secured at its lower end to a loomside and a brake device having a frame pivotally connected to one of said arms and slidable along said rod as said cloth roll is moved towards and away from said take-up roll, said brake device comprising manually controllable means for locking said device to said rod and for locking thereby said cloth roll against movement towards said take-up roll, and normally inoperative, manually operatable means for moving said cloth roll away from said take-up roll.

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