

M. L. STONE.

LOOM.

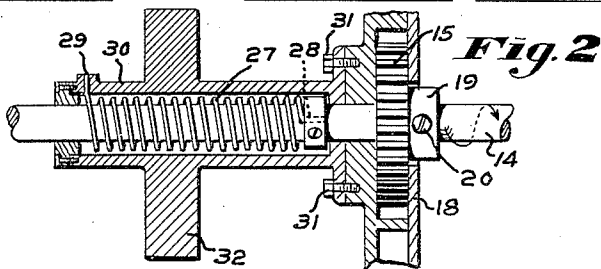
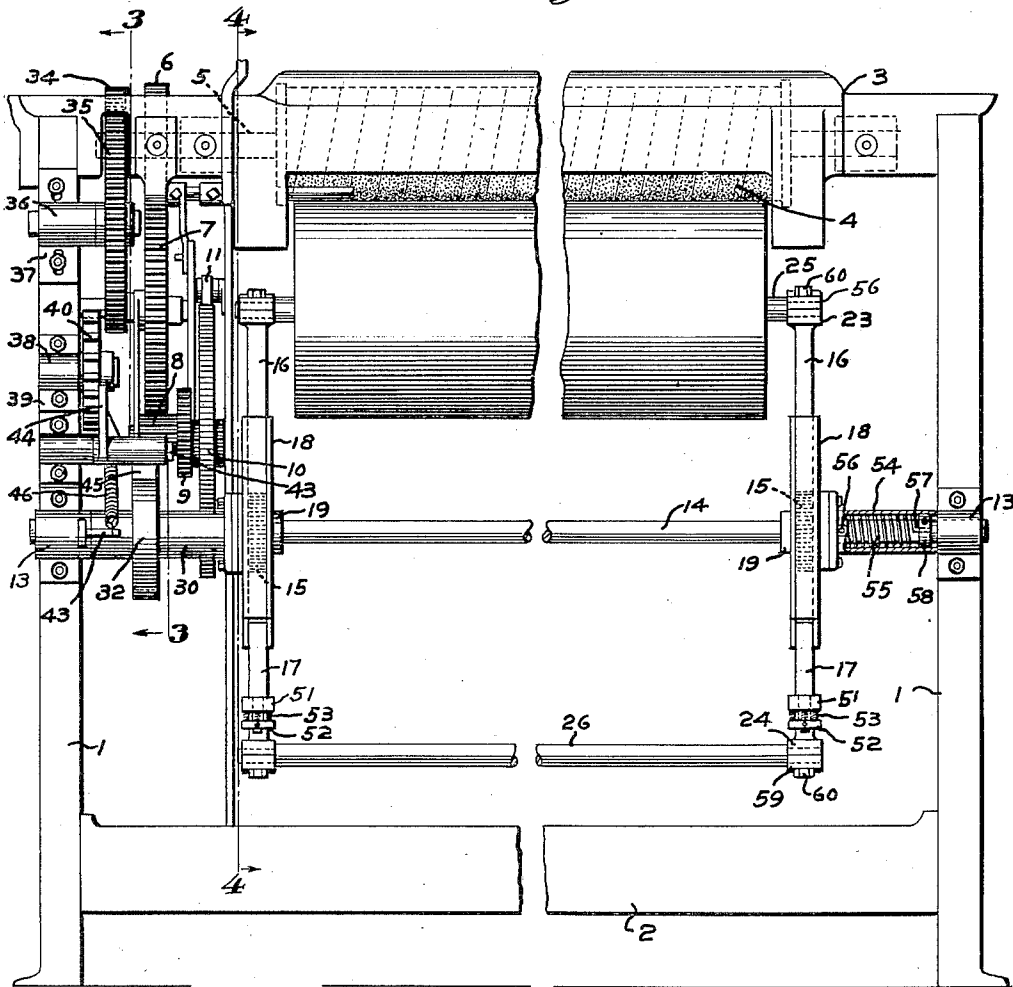
APPLICATION FILED OCT. 11, 1919.

1,345,900.

Patented July 6, 1920.

2 SHEETS—SHEET 1.

Fig. 1



Inventor:
Melvin L. Stone,
by *Robt. D. Davis,*
Attorney

M. L. STONE.
LOOM.

APPLICATION FILED OCT. 11, 1919.

1,345,900.

Patented July 6, 1920.

2 SHEETS—SHEET 2.

Fig. 3

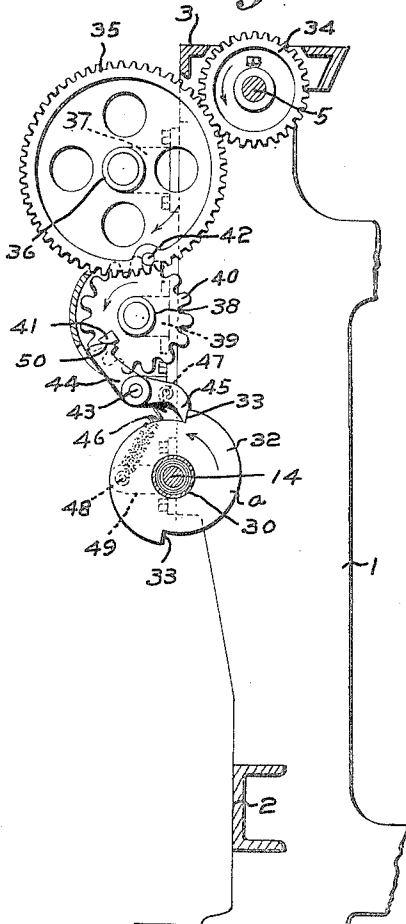


Fig. 4

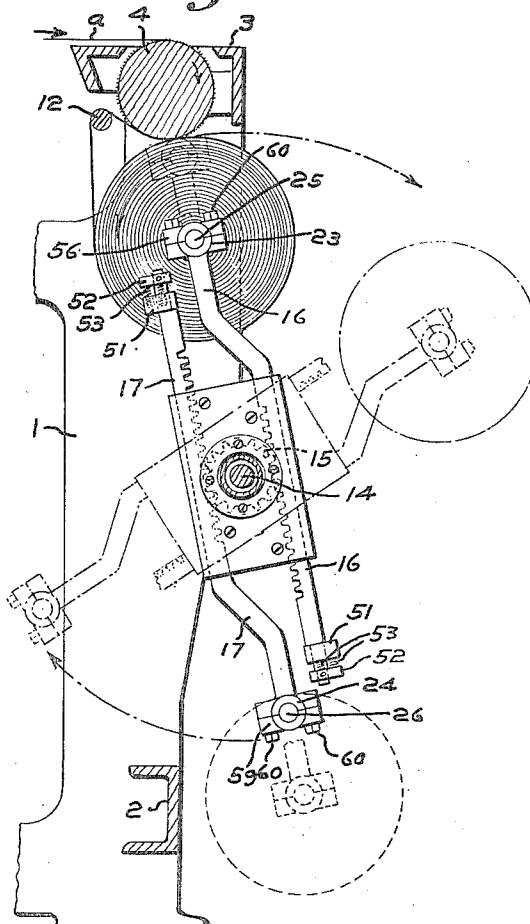
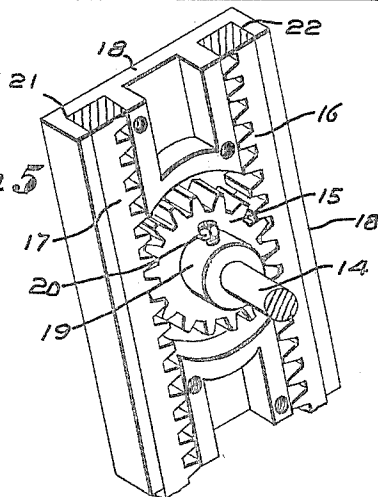


Fig. 5



Inventor:

Melvin L. Stone
by Robt. D. Hains,
Attorney

UNITED STATES PATENT OFFICE.

MELVIN L. STONE, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR TO DRAPER CORPORATION, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

LOOM.

1,345,900.

Specification of Letters Patent.

Patented July 6, 1920.

Application filed October 11, 1919. Serial No. 329,968.

To all whom it may concern:

Be it known that I, MELVIN L. STONE, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawing representing like parts.

The invention to be hereinafter described relates to looms, and more particularly to the means for handling the cloth roll.

During the weaving operation, the cloth is usually taken up as it is woven and wound upon a cloth roll which is yieldingly pressed upwardly into operative engagement with a driving member, such, for instance, as a sand roll, but is adapted to yield downwardly as the diameter of the cloth roll gradually increases, until when the desired length of cloth, usually called a "cut" has been wound upon the cloth roll, the cloth roll and its load is taken from the loom and another cloth roll is substituted therefor. The operation of removing the loaded cloth roll and substituting an unloaded cloth roll therefor usually requires the services of two or more men, and during the removal of the cloth roll it is not unusual to stop the loom, the decreasing production and involving expensive labor manipulation.

The object of the present invention is to provide means for automatically removing a loaded cloth roll from operative relation with the driving member or sand roll when the desired length of cloth has been wound on the cloth roll, and automatically substituting for the loaded cloth roll another cloth roll on which the cloth may be wound.

In carrying the invention into practical effect, a plurality of sets of cloth roll supports, preferably two sets, are mounted upon the loom frame, and yielding means, such as a spring, is employed for projecting the sets of cloth roll supports to yieldingly hold the roll which is operatively related with the driving member pressed thereagainst. When the desired length or "cut" of cloth has been wound upon the cloth roll which is operatively related to the driving member, means are employed which become active to automatically remove the loaded cloth roll from its operative relation with the driving member and substitute therefor an unloaded

cloth roll. This automatic control of the cloth rolls may be variously contrived, and in the present instance, a catch is employed which acts during the winding of the cloth upon the cloth roll, to hold the sets of cloth roll supports from movement as a system, but when the desired length of cloth has been wound upon the cloth roll, releases the system for movement so that the full cloth roll may be removed from and an unloaded cloth roll may be moved to operative relation with the driving member.

The above features of the invention and other novel combinations of parts will be hereinafter described in connection with one good practical form thereof, as shown by the accompanying drawings, and then the invention in its true scope will be defined by the claims.

In the drawings:—

Figure 1 is a front elevation of a loom having the present invention associated therewith, some of the parts which do not directly concern the present invention being omitted;

Fig. 2 is a section on the line 2—2 of Fig. 4;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 1; and

Fig. 5 is an enlarged detached detail showing the operative relation between the roll supporting racks and the shaft with relation to which the racks are individually moved and about which they are jointly rotated.

The general construction of the loom may be of any usual or desired character. The loom frame comprises the side members which are tied together near their bottom portions by the cross piece 2, and at the tops thereof the side frames are connected by the breast beam 3. Mounted upon the machine frame and preferably upon the breast beam is the driving member 4 which, in the present instance, consists of the usual sand roll which may be driven through any suitable train of mechanism from a going part of the loom to appropriately take up the cloth as it is woven. In the present instance of the invention, the sand roll 4 has one of its journals 5 extended at one end, and secured thereto is the toothed wheel or pinion 6 which is operatively engaged with a

toothed wheel or gear 7 which through the toothed wheels 8, 9 and 10, in the present instance, is given a step by step rotary movement from a pawl mechanism 11, the construction being such that as the toothed wheel 10 is rotated, it transmits its rotative movement through the train of mechanism to the driving member or sand roll 4. The mechanism just described constitutes one form of well understood take-up mechanism for giving to the driving member or sand roll 4 a slow rotative movement in the direction of the arrow (Fig. 4) to take up the cloth *a* as it is woven. In order to insure the take-up of the cloth by the sand roll, the cloth is passed about the sand roll 4, as indicated in Fig. 4, and over a guide or rod 12 which may be supported in suitable bearings connected to the loom frame.

Mounted in suitable bearings 13 which may be connected to the side frames 1 of the loom, is the shaft 14 carrying a toothed member or pinion 15 which is engaged with the toothed racks 16, 17 (Fig. 5). The toothed racks 16 and 17 are mounted upon and guided in suitable ways formed in or secured to the boxes or frames 18, there being adjacent at each side of the loom frame, one of these boxes or frames 18 through which a shaft 14 loosely passes. The gear or pinion 15 may be secured to the shaft by a collar 19 and set screw 20, as best indicated in Fig. 2.

Each of the frames 18, one adjacent each side of the loom, is formed with the guide-ways 21 and 22 in which the rack supports 16 and 17 may be moved as the pinion 15 on the shaft 14 is rotated. The toothed racks 16 and 17 carry at their outer ends suitable bearings 23, 24 adapted to support cloth rolls 25, 26 respectively. As hereinbefore noted, the toothed racks 16 and 17 are duplicated at each side of the machine, as indicated in Fig. 1, and the racks 16, one at each side of the loom, constitute one set of cloth roll supports, while the other racks 17, one near each side of the loom, as indicated in Fig. 1, constitute another set of cloth roll supports.

When one of the cloth rolls 25 or 26 is in operative relation with the driving member or sand roll 4, it is desirable that it be pressed outwardly or toward the driving member or sand roll, in order to have wound upon it the cloth as it is woven. As one form of means to this end, the present invention provides a spring which is connected to the shaft 14 and is under tension normally tending to turn the shaft in a direction to cause the racks 16 and 17 to be extended or projected radially or outwardly relative to the shaft. In the present instance of the invention, the shaft 14 is under the stress of a spring 27 (Fig. 2), one end of such spring being connected to a collar

28 secured to the shaft 14, and the other end 29 of the spring being connected to a sleeve 30 loose on said shaft. The sleeve 30 is connected by means such as the bolts 31 to one of the boxes or frames 18 as indicated in Fig. 2, the construction being such that the shaft 14 constitutes one of the anchors to which the spring 27 is secured, and the box or frame 18 constitutes the other anchor of the spring.

The sleeve 30 has mounted thereon the toothed wheel 32, best shown in Fig. 3, said wheel being provided with the stop shoulders 33 arranged substantially 180° apart, the construction being such that when the toothed wheel is held from rotative movement, and the spring 27 is under tension, the effect of the spring, acting through the shaft 14 and pinion 15, is to project the racks 16 and 17 and cause the cloth roll which is adjacent the driving member or sand roll 4 to be operatively related.

As hereinbefore indicated, the present invention contemplates that when the cloth roll which is in operative relation with the driving member has had wound thereon the desired length or "cut" of cloth, the loaded cloth roll shall be automatically released and moved from its operative relation with the driving member and an unloaded cloth roll be substituted therefor. In the present instance of the invention, this operation of the mechanism to substitute an empty for a full cloth roll, is effected through the spring 27 which also acts to project the cloth rolls outwardly.

Mounted on or secured to the driving member or sand roll 4 is a toothed wheel or gear 34 (Fig. 3) which is in operative engagement with the toothed wheel or pinion 35 mounted in suitable bearings 36 carried by brackets 37 secured to the loom frame. Mounted in a bearing 38 carried by a bracket 39, which may also be secured to the loom frame, is a toothed or star wheel 40 carrying a trip 41 preferably secured thereto and extending from one face thereof. The toothed wheel or pinion 35 carries a pin 42 which, as the toothed wheel or pinion 35 is rotated, is adapted to engage between the teeth of the star or toothed wheel 40 and impart a step by step movement thereof in the direction of the arrow (Fig. 3), the construction being such that upon each rotation of the gear or toothed wheel 35, the pin 42 will give to the star or toothed wheel 40 a step movement in the direction of the arrow.

Pivotaly mounted at 43 (Fig. 3) is a catch or pawl 44, one end 45 of which is adapted to engage the shoulders 33 of the toothed wheel 32. A spring 46 acts upon the catch or pawl 44 normally tending to hold the end 45 in operative relation with one of the shoulders 33. The spring 46 has one end secured to the pawl as at 47, and

the other end secured at a fixed point 48 preferably provided on an arm 49 secured to the loom frame.

The catch or pawl 44 has at its opposite end as at 50 an inclined portion which, as the toothed or star wheel 40 is rotated step by step, is finally engaged by the lug 41 carried by the toothed or star wheel 40, the construction being such that the pawl 44 will be tripped from its engagement with a shoulder 33 of the toothed wheel 32 by the lug 41, which thereupon at once passes out of engagement with the pawl and permits the spring 46 to return the end 45 of the pawl into position to engage the next shoulder 33 of the toothed wheel when the latter has rotated through an arc of approximately 180°.

When one of the cloth rolls 25, 26 is in position to have the cloth wound thereon, the end of the cloth is connected to the roll by the attendant, and the pressure between the cloth roll and driving member 14 causes the cloth to be wound upon the cloth roll. As the roll of cloth on the cloth roll increases in diameter, the racks or supports 16 and 17 are moved inwardly from the position indicated in dotted lines (Fig. 4) to the position indicated by full lines. During this winding operation, the catch pawl 44 remains in engagement with one of the shoulders 33 of the toothed wheel 32, and the tension of the spring 27 is exerted through the pinion 15 and the racks or supports 16 and 17 to yieldingly hold them outwardly, but permit inward movement thereof as the cloth roll gradually increases in diameter. This inward movement of the racks 16 and 17 rotates the shaft 14 in the direction of the arrow indicated in Fig. 2, and serves to give further tension to the spring 27. When the desired length of cloth or a "cut" has been wound upon the cloth roll 25, in the present instance, the trip lug 41 on the toothed or star wheel 40, trips the catch pawl 44, whereupon, the toothed wheel 33 and perforce the sleeve 30 and the box or frame 18 connected thereto, is free for rotative movement under the stress of the spring 27. This rotation of the boxes or frames 18 causes the supports or racks 16 and 17 to be moved as a system or unit in the direction of the arrow (Fig. 4), thus removing the full cloth roll from operative relation with the driving member or sand roll 4, and substituting in its place the cloth roll 26 carried by the other set of supports or racks 17. When the cloth roll 26 has reached its operative relation with the driving member or sand roll 4, the end 45 of the catch pawl 44 engages one of the shoulders 33 of the toothed wheel 32 and stops further bodily rotative movement of the system. Further action of the spring, however, tends to move the supports or rack bars 16 and 17

outwardly to thereby force the new empty cloth roll 26 toward the driving member or sand roll 4.

In order to cushion the outward movement of the supports or racks 16 and 17 under the impulse of the spring 27, each of these supports or racks may be provided with a cushioning spring. In the present instance, this cushion effect is provided by means of collars 51, one of which is secured on the racks 16 and 17, as indicated in Fig. 4. Interposed between the loose collar 51 and a fixed collar 52, one of which is secured to each of the racks 16 and 17, are the springs 53 which serve to cushion the outward movement of the supports or racks when the loose collars 51 engage the end portions of the boxes or frames 18.

In most instances, one spring 27 will be sufficient to give the outward movement of the supports or racks 16 and 17 as well as the rotative movement of the system in substituting an unloaded for a loaded cloth roll, but in some instances it may be desired to have further assistance, and this may be provided by duplicating the spring action of the spring 27 at the opposite side of the loom, as indicated in Fig. 1. In the construction shown, the box or frame 18 at the right (Fig. 1) has secured thereto a sleeve 54 in which is contained the spring 55, one end of which is connected at 56 to the box or frame 18, and the other end of which is connected at 57 to a collar 58 secured to the shaft 14, the construction being such that the spring 55 acts as an assistant to the spring 27 in effecting the described movement of the supports or racks 16 and 17.

Each of the supports or racks 16 and 17 at its outer end is provided with a bearing for a cloth roll, and when the cloth roll is seated in such bearing, it should be prevented from accidental escape therefrom. Suitable means which may suggest themselves to anyone skilled in the art, may be used for this purpose, but in the present instance, the bearings 23 and 24 have cap pieces 59 which are fed over the journals of the cloth rolls and are secured to the bearings by means of bolts 60.

What is claimed is:—

1. In a loom, the combination of a rotary driving member, two sets of rack supports, each set of which is adapted to support a cloth roll, a casing in which the rack supports are mounted, means acting upon the casing and tending to turn it to carry one set of rack supports into and the other set of rack supports from operative relation with the driving member, and a catch for restraining the operation of said means until the cloth roll that is in operative relation to the rotary driving member has a predetermined amount of cloth wound thereon.

2. In a loom, the combination of a rotary

- driving member, two sets of rack supports, each set of which is adapted to support a cloth roll, a casing in which the rack supports are mounted, means acting upon the casing and tending to turn it to carry one set of rack supports into and the other set of rack supports from operative relation with the driving member, a catch for restraining the operation of said means until the cloth roll that is in operative relation to the rotary driving member has a predetermined amount of cloth wound thereon, and a trip actuated from the rotary driving member for tripping the catch.
3. In a loom, the combination of a driving member, two sets of cloth roll supports, each set being adapted to hold a cloth roll, means tending to move one set of cloth roll supports from and the other set of roll supports to operative relation with the driving member, a catch for restraining the operation of said means, and a trip to free the said means from control of the catch when a predetermined amount of cloth has been wound upon a cloth roll which is in operative relation to the driving member.
4. In a loom, the combination of a driving member, two sets of cloth roll supports, each set being adapted to hold a cloth roll, connections between the two sets of cloth roll supports for simultaneously moving them in opposite directions, means tending to move one set of cloth roll supports from and the other set to operative relation with the driving member, a catch restraining the operation of said means, and a trip acting to free the said means from the restraint of the catch when a predetermined amount of cloth has been wound upon the cloth roll which is in operative relation to the driving member.
5. In a loom, the combination of a driving member, two sets of supporting racks, each set being adapted to support a cloth roll in operative relation to the driving member, a toothed connection between the two sets of supporting racks for moving them simultaneously in opposite directions, and spring actuated means connected to the two sets of supporting racks and acting when a predetermined amount of cloth has been wound upon a cloth roll by the driving means, to remove the full cloth roll from and an empty cloth roll to operative relation with the driving means.
6. In a loom, the combination of a driving member, two sets of supporting racks, each set being adapted to support a cloth roll in operative relation to the driving member, a toothed connection between the two sets of supporting racks for moving them simultaneously in opposite directions, and means for moving the two sets of supporting racks simultaneously to remove one cloth roll from and another cloth roll to operative relation with the driving member.
7. In a loom, the combination of a driving member, two sets of cloth roll supports, each set being adapted to hold a cloth roll in operative relation to the driving member, and means for simultaneously swinging the two sets of cloth roll supports about a common center for removing one set of cloth roll supports from and the other set of cloth roll supports to operative relation with the driving member.
8. In a loom, the combination of a rotating driving member, a cloth roll, supports for holding the cloth roll in operative relation to the driving member to cause the cloth to be wound on the cloth roll, and automatic means which is rendered effective for removing the cloth roll and its load from operative relation to the driving member when a predetermined amount of cloth has been wound upon the cloth roll.
9. In a loom, the combination of a rotating driving member, a cloth roll, rack supports for the cloth roll, means connected to the rack supports for holding the cloth roll in operative relation to the driving member and acting automatically to remove the cloth roll and its load from operative relation with the driving member when a predetermined amount of cloth has been wound upon the cloth roll.
10. In a loom, the combination of a driving roll, two sets of cloth roll supports, each set being adapted to hold a cloth roll in driving contact with the driving roll, and means for moving one set of cloth roll supports from and the other set of cloth roll supports to operative relation with the driving roll.
11. In a loom, the combination of a driving member, two sets of supports, each set being adapted to support a cloth roll, and mounted for movement to place said cloth roll successively in operative relation with the driving member, a catch for holding either of said supports in position with its cloth roll operatively related to the driving member, and means acting automatically for tripping the catch when the cloth roll that is operatively related to the driving member has a predetermined amount of cloth wound thereon.
12. In a loom, the combination of a driving member, two cloth rolls mounted for successive movement into operative relation with the driving member, and means connected to the cloth rolls and acting automatically when a predetermined amount of cloth is wound on one of the cloth rolls for moving the loaded cloth roll from and the unloaded cloth roll to operative relation with the driving member.
13. In a loom, the combination of a driving member, two cloth rolls mounted for successive movement into operative relation with the driving member, and spring actuated means connected to the cloth rolls and

acting automatically when a predetermined amount of cloth is wound on one of the cloth rolls for moving the loaded cloth roll from and the unloaded cloth roll to operative relation with the driving member.

14. In a loom, the combination of a driving member, two sets of cloth roll supporting rack bars mounted for swinging movement about a common center, spring actuated means tending to extend the two sets of rack bars in opposite directions and to swing the two sets about their common center, means for restraining the swinging movement of the rack bars responsive to said spring actuated means until the cloth roll operatively related to the driving member has wound thereon a predetermined length of cloth.

15. In a loom, the combination of a driving member, supporting arms for holding a cloth roll, and mounted for swinging movement to carry the cloth roll toward and from operative relation with the driving member, means for preventing swinging movement of the arms while the cloth is being wound on the cloth roll, and means acting automatically when a predetermined length of

cloth has been wound on the cloth roll for swinging the arms and carrying the cloth roll and its load away from the driving member that the cloth may be removed.

16. In a loom, the combination of a driving roll, two sets of cloth roll supports, each of which is constructed and arranged to hold a cloth roll in operative relation to the drawing roll that the cloth may be wound upon the driven cloth roll as it is woven, and means acting automatically when a predetermined amount of cloth has been wound upon the driven cloth roll for shifting the positions of the cloth roll supports.

17. In a loom, the combination of a driving roll, two sets of cloth roll supports, each of which is constructed and arranged to yieldingly hold a cloth roll in operative relation to the driving roll that the cloth may be wound upon the driven cloth roll as it is woven, and means acting automatically when a predetermined amount of cloth has been wound upon the driven roll for shifting the positions of the cloth roll supports.

In testimony whereof I have signed my name to this specification.

MELVIN L. STONE.