

Sept. 27, 1960

F. H. BLAKE
STICK WEAVING LOOM

2,954,055

Filed Nov. 28, 1955

8 Sheets-Sheet 1

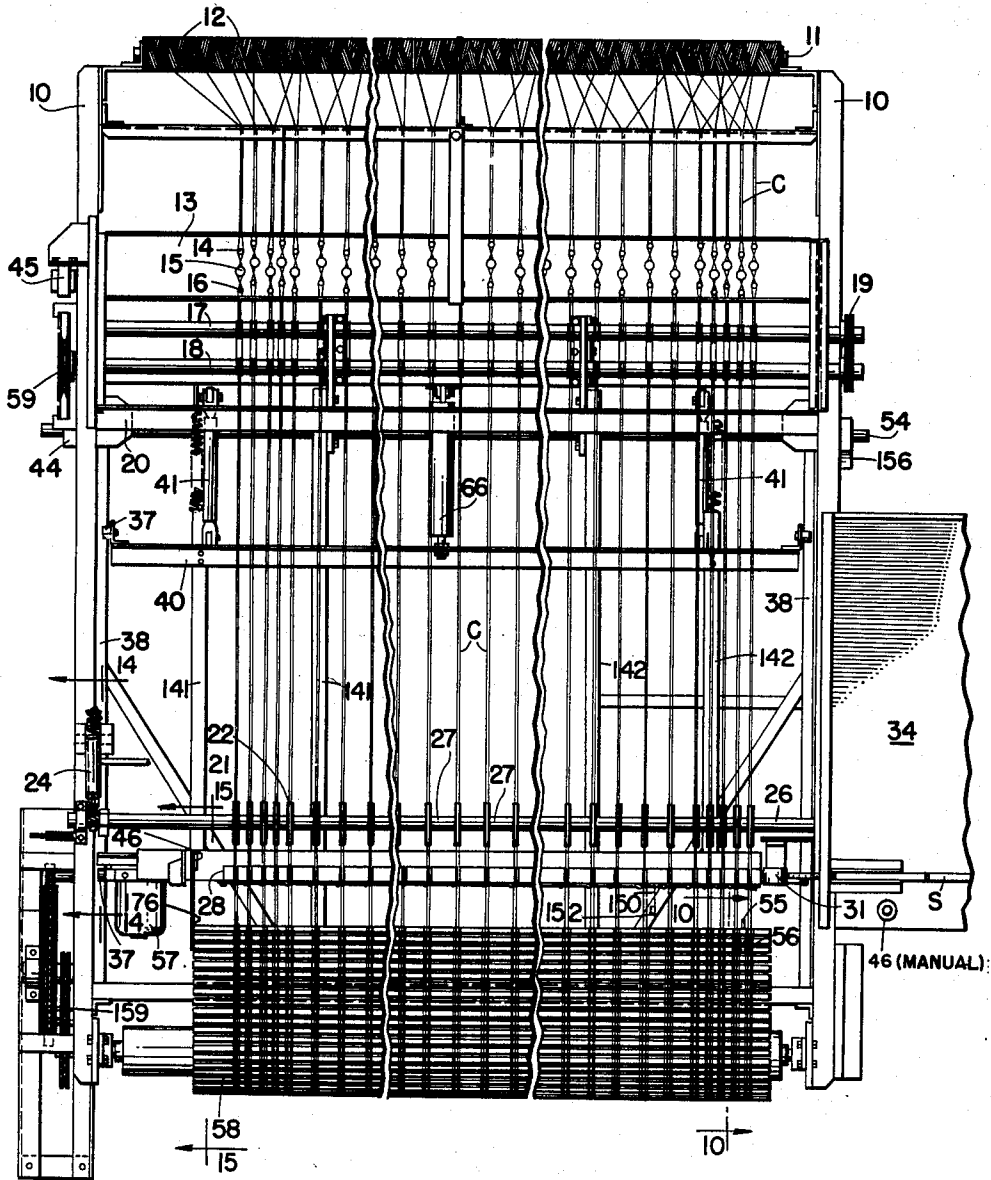


Fig. 1

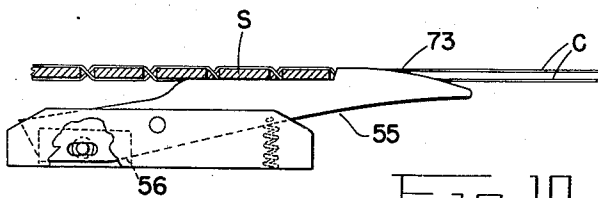


Fig. 10

INVENTOR.
BY *FREDERICK H. BLAKE*
Smith & Tuck
ATTORNEYS

Sept. 27, 1960

F. H. BLAKE

2,954,055

STICK WEAVING LOOM

Filed Nov. 28, 1955

8 Sheets-Sheet 2

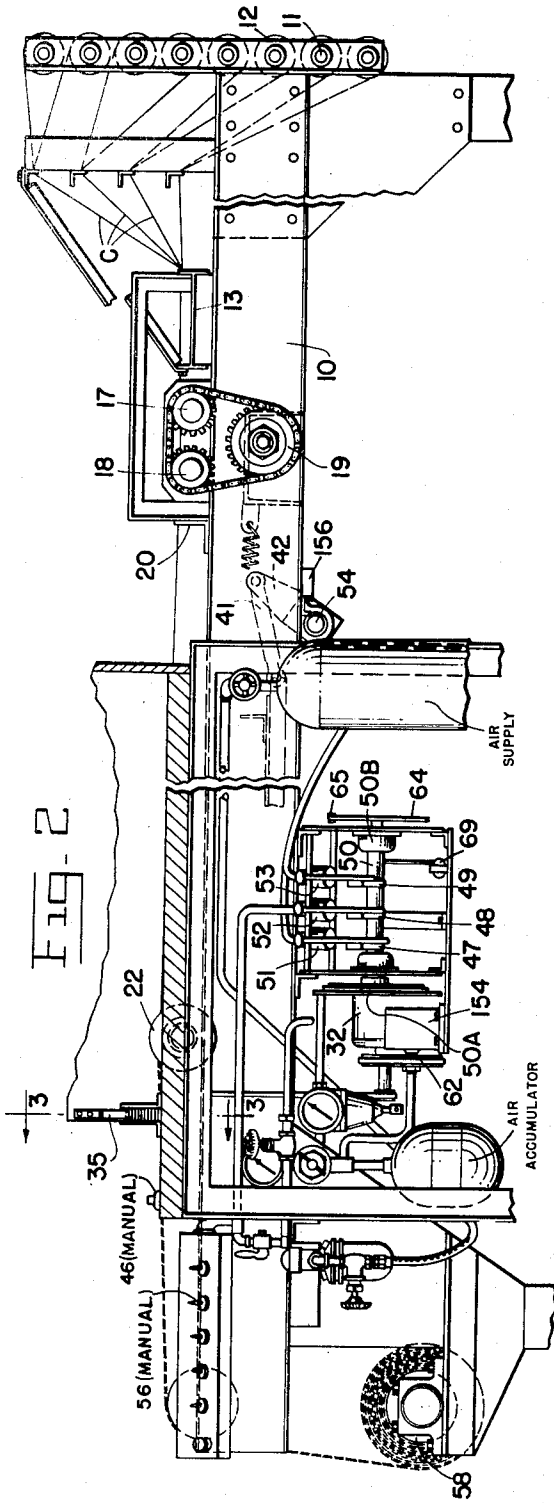


FIG-2

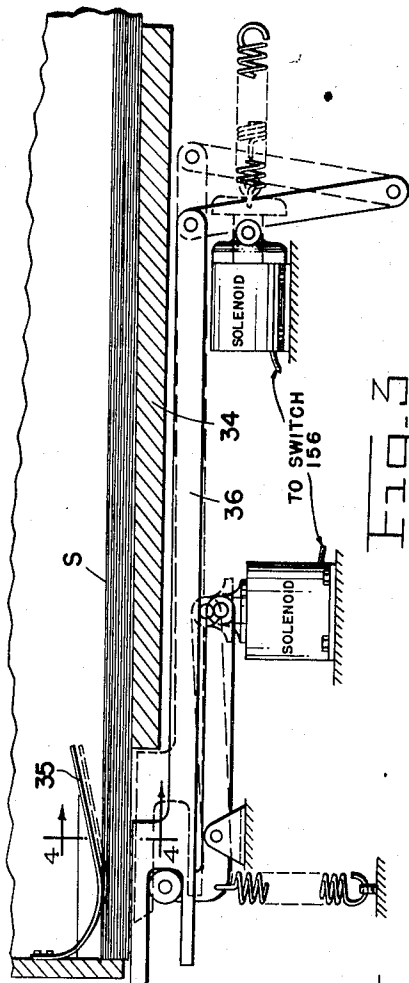


FIG-3

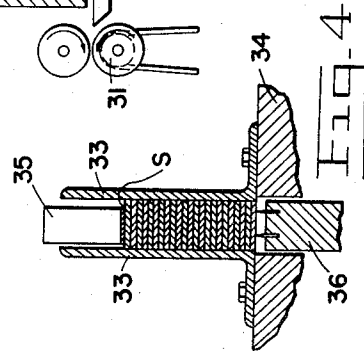


FIG-4

INVENTOR.

FREDERICK H. BLAKE

BY

Smith & Tuck

ATTORNEYS

Sept. 27, 1960

F. H. BLAKE
STICK WEAVING LOOM

2,954,055

Filed Nov. 28, 1955

8 Sheets-Sheet 3

Fig. 5

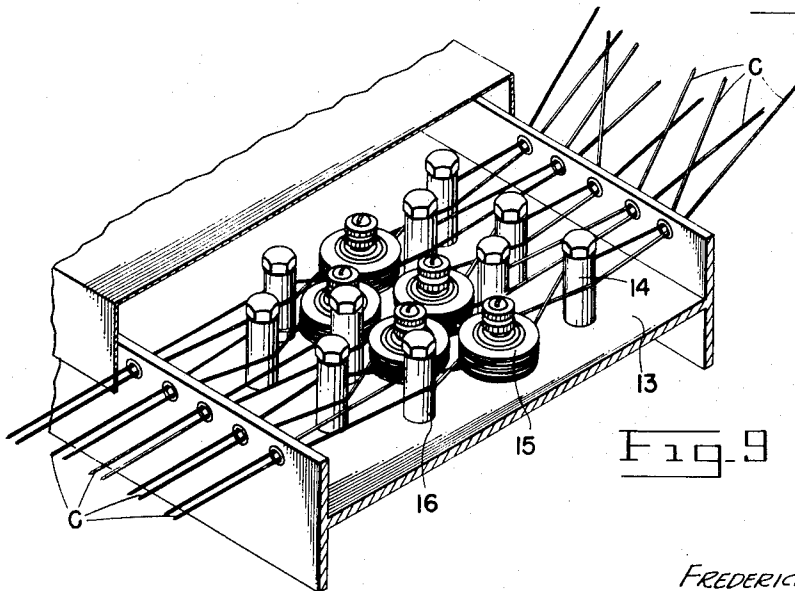
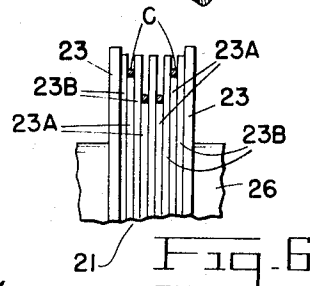
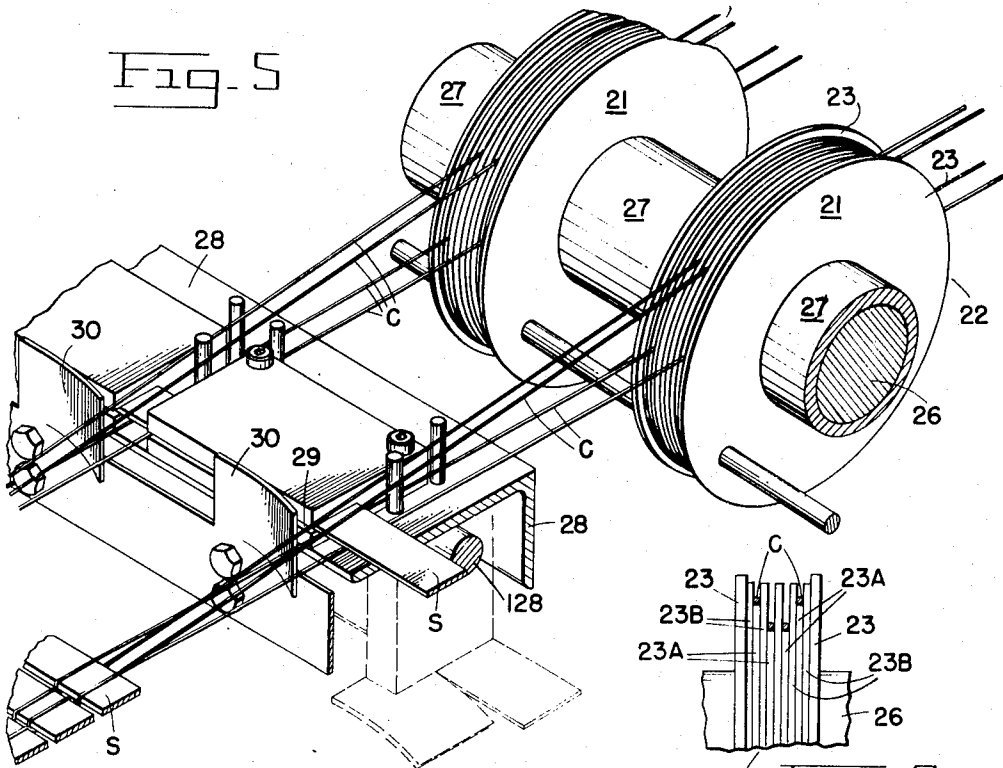


Fig. 9

INVENTOR.
FREDERICK H. BLAKE
BY
Smith & Tuck
ATTORNEYS

Sept. 27, 1960

F. H. BLAKE
STICK WEAVING LOOM

2,954,055

Filed Nov. 28, 1955

8 Sheets-Sheet 5

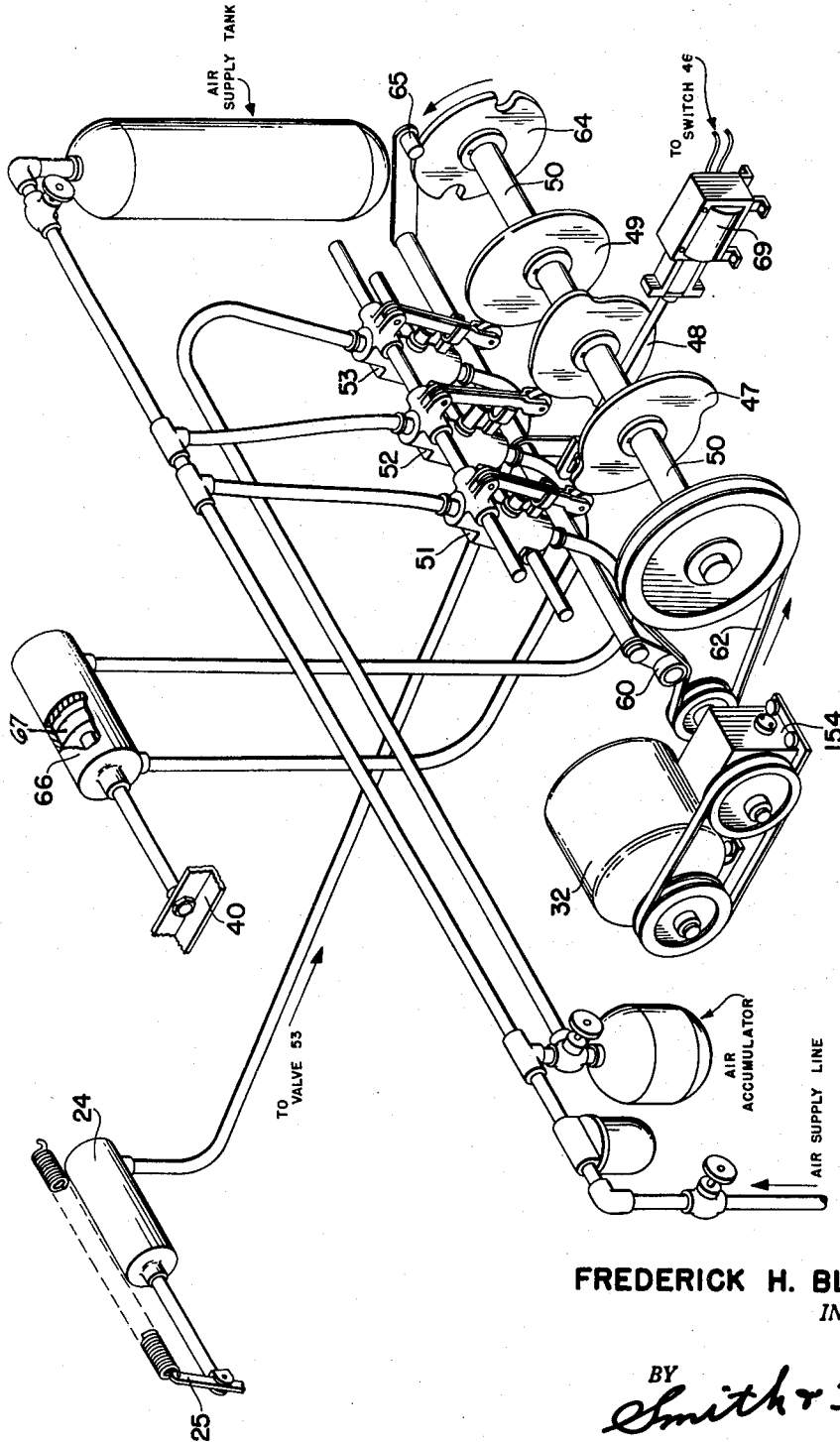


FIG 8

FREDERICK H. BLAKE
INVENTOR.

BY
Smith & Tuck

Sept. 27, 1960

F. H. BLAKE
STICK WEAVING LOOM

2,954,055

Filed Nov. 28, 1955

8 Sheets-Sheet 6

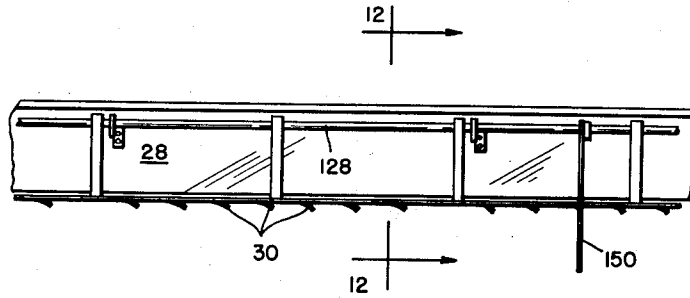


FIG. 11

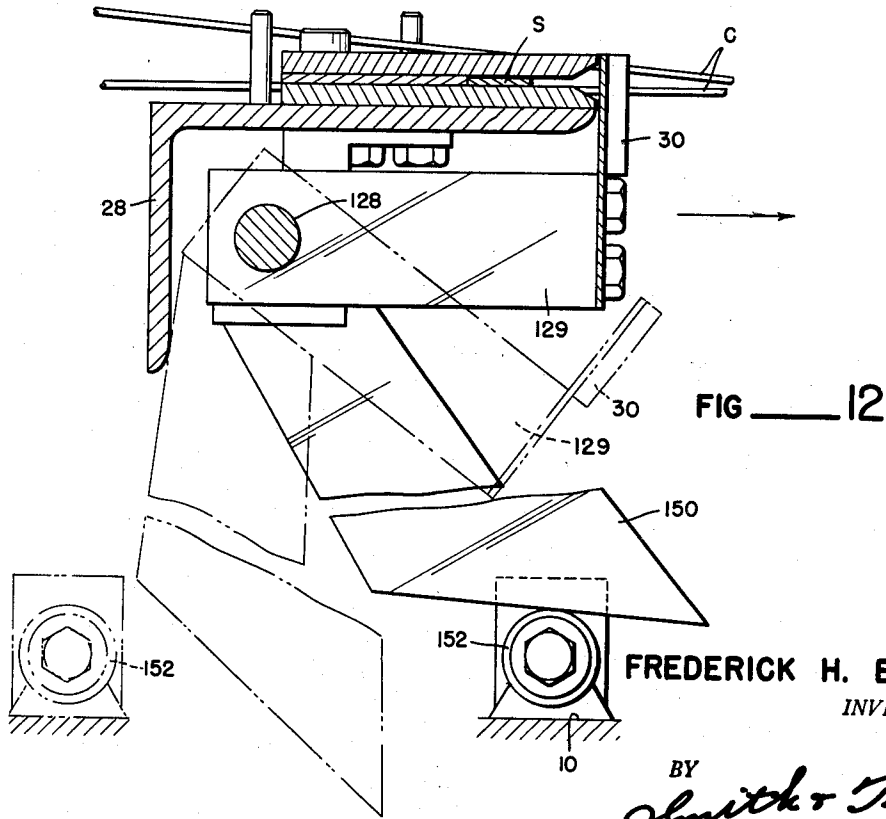


FIG. 12

FREDERICK H. BLAKE
INVENTOR.

BY
Smith & Tuck

Sept. 27, 1960

F. H. BLAKE
STICK WEAVING LOOM

2,954,055

Filed Nov. 28, 1955

8 Sheets-Sheet 7

FIG. 13

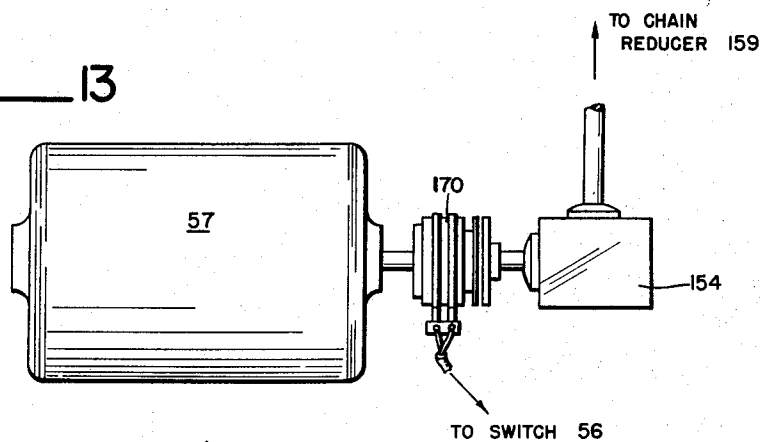
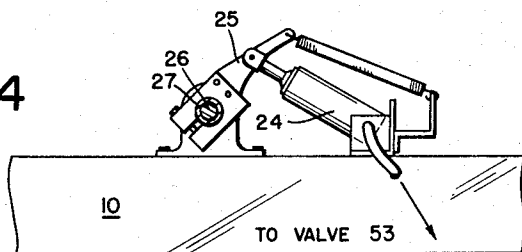


FIG. 14



FREDERICK H. BLAKE
INVENTOR.

BY
Smith & Tuck

Sept. 27, 1960

F. H. BLAKE
STICK WEAVING LOOM

2,954,055

Filed Nov. 28, 1955

8 Sheets-Sheet 8

FIG. 15

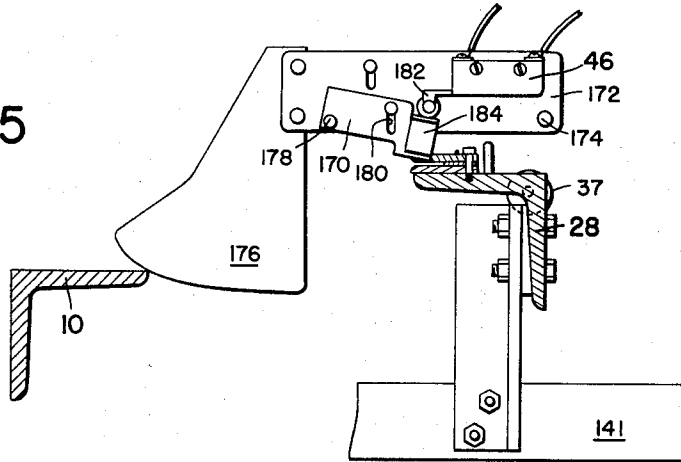


FIG. 16

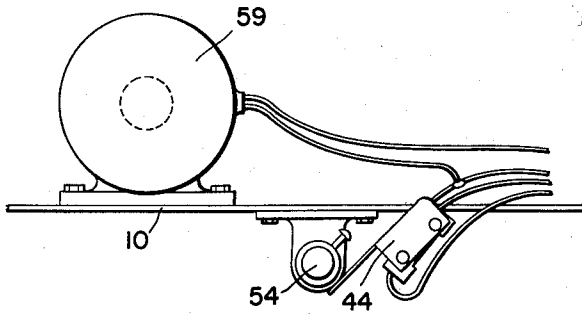
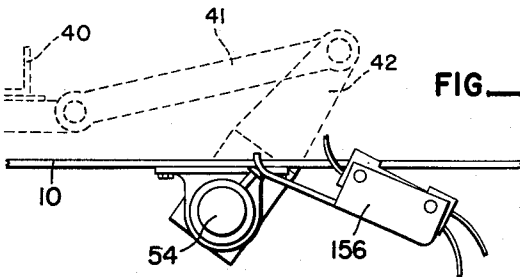


FIG. 17



FREDERICK H. BLAKE
INVENTOR.

BY
Smith & Tuck

1

2,954,055

STICK WEAVING LOOM

Frederick H. Blake, Medina, Wash.

(1045 91st NE., Bellevue, Wash.)

13 Claims. (Cl. 139—28)

This invention relates to the general art of looms for weaving and more particularly to a loom which is especially constructed for the handling of thin strips of wood and weaving them by more or less conventional methods, into heavy screen fabrics which are suitable for use as folding doors such as used on closets, room dividers, and the like, and for use on windows as shades or draperies where it is desired to block out a good portion of the light passing through, and thus produce a filtering of the light.

In constructing a loom for weaving stick material many conditions and requirements must be met which are not present in the ordinary weaving of fabrics. One of these conditions arises from the fact that the wood strips are of a definite uncompressible width and it therefore becomes necessary that extreme care be given to the tensioning of the various strings or cords which provide the warp, otherwise the curtain material when completed will not hang straight but will have a bias twist which makes it entirely unsuitable for vertical hanging. It is also necessary that full care and consideration be given to producing a quality product but at the same time keeping the expense of manufacture within reasonable bounds to the end that a commercial product will result from the weaving operation. It is to provide a loom which will take the limber or supple thin wood strips of the order of one-twentieth of an inch thick and one-quarter of an inch wide and weave them into a material which can be adapted to a wide variety of uses and still be sold to the ultimate consumer at a price that is truly competitive with other materials providing a similar usefulness and appearance.

The principal object of this present invention is to provide a loom for the weaving of slat-like material of small dimension into material of sufficient width so that it can be hung with the slats vertical and serve as curtain material, room dividing material, and serve also as a closure for door openings.

A further object of this invention is to provide a loom in which extreme care is given to the tensioning of the various cords forming the warp of the woven material to the end that straight hanging material will result.

A further object of this invention is to provide in a weaving loom a plurality of elements each of which contributes to the control of the weaving operation so that tensioning is the same on all of the warp cords and the relatively slender sticks or slats may be woven into a finished material capable of being folded on any of the longitudinal juncture openings between adjacent slats or sticks.

A further object of this invention is to provide a loom for the weaving of slatted wood materials which is automatic in operation to the end that weaving can be conducted with speed and thus keep the cost of the finished product on a competitive basis with other materials that might serve the same general purpose.

2

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

5 In the drawings:

Figure 1 is a top plan view of a loom made after the teachings of this present invention, the same being broken along two lines so as to reduce the width of the showing;

10 Figure 2 is a side elevation of the loom illustrated in Figure 1 with certain parts shown in section;

Figure 3 is a vertical sectional view taken along the line 3—3 of Figure 2;

Figure 4 is a cross sectional view in elevation along the line 4—4 of Figure 3;

15 Figure 5 is an enlarged perspective view, partly in section, illustrating the handling of the warp cords, the insertion of the wood slats and the shedding arrangement employed to properly position the warp cords as successive sticks are introduced into the weaving;

20 Figure 6 is a fragmentary elevation of the shedding cam arrangement as viewed along the plane of the cam discs and showing substantially the material from the center of the supporting shaft upwardly;

25 Figure 7 is an electrical diagram illustrating the circuits involved in the timing of the various sequences of operations;

Figure 8 is a diagrammatic view illustrative of the air control means employed;

30 Figure 9 is a perspective view, partly in section, illustrating one small section of the cord tensioning means employed in this loom; and

Figure 10 is a vertical cross-sectional view taken along the line 10—10 of Figure 1.

35 Figure 11 is a bottom plan view of the beater bar and associated parts.

Figure 12 is a cross sectional view taken along the line 12—12 of Figure 11 with certain of the parts in section and showing a second position of the parts in dot and dashed line.

40 Figure 13 is a top plan view of a preferred form of an electric motor drive showing the same coupled to a magnetic clutch and a right angle reduction gear.

Figure 14 is a fragmentary view in elevation, and showing the heidle cam shaft in cross section.

45 Figure 15 is a cross sectional view of the beater bar and certain associated parts to show the construction of the switching means employed to initiate the movement of the beater bar.

50 Figure 16 is a fragmentary end elevation view of shaft 54 and frame 10 to illustrate the switching means for one of the electric brakes.

55 Figure 17 is an end elevation of the opposite end of shaft 54, as illustrated in Figure 16, showing the switch for the solenoids actuating the stick feeding means. Certain of the operational elements are shown in dashed lines as these parts would normally be hidden from view.

60 Referring more particularly to the disclosure in the drawings, the numeral 10 is the frame of my loom which is preferably made in a substantial manner as being fabricated out of structural steel shapes. The preferred positioning of this frame is in a horizontal plane at about table height. This permits a most adequate inspection and adjustment of the loom from time to time as conditions may vary slightly. Frame 10 is provided with a plurality of supporting members or legs so as to hold the frame in this preferred position.

65 Fixedly secured to frame 10 is a vertically disposed frame member adapted to support a plurality of shafts 11, upon which are revolvably positioned a large number of spools of cord forming the warp, as 12. As the spools of cord 12 are placed on shafts 11 means should also be

3

employed to insure the retaining of the cords on the spools without any tendency for the same to drop off the ends of the same. Normally, disc-like flange members disposed on shaft 11 are satisfactory for this purpose. After leaving spools 12 cords C are lead to convenient guiding means so as to bring the cords substantially in alignment with their final position on the loom. The cords are then passed through grommeted openings in the flange of the tensioner supporter 13, as will be probably best understood from a study of Figure 9 of the drawings, and divided by collared bolts 14. The cords are next crossed over to the opposite hand and placed between the spring loaded flanges of the tensioners 15. The threads are then re-crossed and lead around the collared bolts 16 and through grommeted holes in the second flange of the tensioner support. Tensioners 13 are quite well known in this field in that they are furnished to provide that the cords pass through or between two plates that are spring urged together. The springs may be adjusted to provide the desired frictional engagement with the cords within their capacity.

The dependable smooth range of tensioners of the type illustrated is from 0 to $\frac{3}{4}$ of one pound. As approximately 3 pounds of tension is required in this loom the bulk of the cone is achieved by a plurality of rolls, to be described. The tensions 13 may therefore be considered as an adjusting or vernier means to achieve the tension required on certain of the cords or to provide uniform tension throughout.

The threads or cords C are then passed over and once around shafts 17 and 18, which shafts are mounted transversely of the frame 10 and are at right angles to the direction of movement of the threads. The threads first are passed over shaft 17, under said shaft and brought through to the right of their respective sides. They are then passed over shaft 18, under said shaft and brought through to the left of their respective sides. This shifting from right to left compensates for the lay or twist of the threads which are cord-like and consist of the plurality of yarns which are twisted into a thread or cord. It has been found that unless this arrangement is provided for, the threads will travel to the right at all times due to the lay of the threads and increase the tension by irregular amounts and in some cases bind and break the threads. Shaft 18 is of slightly larger diameter than shaft 17. This difference being in the order of three thousandths of an inch (.003") on an overall shaft diameter of one and one-quarter inches. Means are provided to insure that shafts 17 and 18, however, travel at the same rotary speed. One means for providing this relationship is illustrated in Figure 2 in which it will be noted that a sprocket is secured to each of shafts 17 and 18 and they are in turn connected by a chain. A preferred arrangement employs an idler, as illustrated at 19, so that adjustment can be made on the connecting chain. Within the idler sprocket a torque adjustment device of conventional design may be advantageously employed. Shafts 17 and 18 are operated solely by the friction created by the wrap-around cords C, which cords are under tension supplied by the main take-up roll 58. Shaft 18 having a larger diameter than shaft 17, but operating at the same r.p.m. puts a tension of a few pounds on the threads. This is a differential tension between the two rolls 17 and 18. The friction clutch or torque device incorporated in the idler may be employed to slow down the speed of both rolls slightly, and thus put an over-riding tension on the cords.

The threads or cords are then guided through grommeted holes in angle 20 in such a manner that adjacent pairs are teamed together in a group of four cords. These adjacent pairs are passed through shedding means 21. The shedding cams 22 consist of two side plates 23 slightly larger in diameter than the cam plates 23A and the spacer plates 23B. This assembly is fixedly secured together to give a preferred displacement of the cords during the operational cycle. The cam plates are circular about the

4

shaft centers with a portion sheared off, which portion is taken off along a chord of the circle. The relationship of these parts are probably best illustrated in Figure 5 and in the fragmentary view of Figure 6. The shedding mechanism is operated as a complete unit by air cylinder 24 attached to arm 25 and is mounted transversely to the axis of shedding shaft 26. The individual shedding cams are spaced apart by tubular spacers 27. By forcing air into shedding cylinder 24 at regular intervals the arm 25, which has a suitable spring attached for return movement, is operated in an arc of approximately 90 degrees permitting the threads to change their respective position as determined by the cams.

The threads are next guided through beater bar 28, which has a longitudinal passageway 29 in it that receives the strip of wood S. These wood strips, which are very flexible, are moved into position by a set of feed rolls 31, which are powered by a V belt drive from motor 32. The handling of the wood strips can best be understood from Figures 2, 3 and 4 where it will be noticed that the strips S are held in place between angles 33 and held down against table 34 as by a leaf spring 35. Arm 36 is powered by solenoids so situated and timed as to move the arm in a rectilinear pattern. This arm has needle points affixed to the top surface that engages the under surface of the strips and move them into engagement with the feeder rolls 31. The rolls 31 feed the strips at considerable speed through the passageway 29 and, to insure the continuous movement of the strips throughout the length of this opening and through the various groups of cords, a series of guides or deflectors 30 are provided, one, preferably, for each cord opening so as to insure that, even though strips are supple and may be slightly twisted, they will feed clear through. At the extreme end of their travel, the strip strikes and actuates switch 46, which is at the furthest end of the feeder bar from rolls 31 and this actuates belt tightener 60 and provides a power drive through belt 62. Power is thus available from motor 32 and is transmitted to the gear reduction unit and then to shaft 50, which shaft in turn is suitably supported on bearings 50A and 50B. This general showing is illustrated in Figure 2 and diagrammatically in Figure 8. Where reduction ratios are substantially fixed for various types of weaving, gear reduction units 154 are employed. Such units are employed in the valve and cam assembly illustrated in Figure 2 and further the similar type of reduction gear is used between the wind-up motor 57 and the chain reduction drive 159. This arrangement has been indicated in Figure 13.

Mounted transversely to the axis of shaft 50 is the slotted timing plate 64 and equally spaced on said shaft are the cams 47, 48 and 49. Cam 47 is of a symmetrical shape with two high points and operates valve 51 allowing air pressure to enter the cylinder 66 and drive the piston 67 connected to the beater bar. The piston rod is attached to beater bar frame 28 which is guided by rollers 37 and is driven with considerable force, and drives the strip of wood just put in place against the adjacent strip which was put in place on the previous cycle. It will be understood of course, that the wood slats do not actually meet as they are held apart by the plurality of cords or strings C. As cam 47 begins its return to neutral position cam 48 operates valve 52 that, in turn, delivers air pressure to cylinder 66 in the opposite direction and returns the beater bar piston 67 to its original position.

Tightener 60 and disc follower 65 are mounted on a common shaft for simultaneous operations and as follower 65 drops into either of the slots of disc 64, the tightener 60 is withdrawn from belt 62 and shaft 50 stops momentarily. Disc 64, in effect, holds the belt tightener in the applied or tightening position even though the solenoid 69 is de-energized. Normally follower 65 acting as a latch holds the tightener in the operative position for one half of a revolution of plate 64 when it then drops

into one of the slots in plate 64, it turning one half revolution for each stick woven.

As cam 48 returns to a neutral position, cam 49 actuates valve 53 that, in turn, admits air pressure to force the piston in shedding cylinder 24 to its extreme stroke thereby causing the shedding cams 23A to revolve approximately ninety degrees and thus change the position of the cords or threads. Referring to Figure 5, this would mean that the pair of cords shown uppermost in Figure 5 as they engage the cams would change elevational position with the two lowermost, which would be moved to the upper position. This action is a very common one in looms, but in this present instance the operation is cam operated and this is desirable in its present operation in that the various sequence of operation must be accurately timed if the loom is to operate at an economical and relatively high speed.

The beater bar 28 is connected by suitable framework to a transverse frame member 40 as the longitudinally disposed bars 141 and 142. This member, like the beater bar, is guided on suitable rollers 37, and as the beater bar frame and assembly returns to its normal position its motion is transferred to countershaft 54 by means of turnbuckles and crank units 41 and 42. Countershaft 54 in its partial rotation given by this means actuates switch 44, which switch has a two-fold purpose. Referring back to the period when the beater bar strikes the strip of wood home to its final position, the bar engages bayonet member 55 attached to switch 56 and this switch energizes the magnetic clutch switch on wind-up motor 57. Bayonet member 55 is urged upwardly by spring means to de-energize switch 56. When sticks S overlay point 73 the bayonet member is depressed and switch 56 energized and the beater bar is operated once for each stick until the sticks are all in place as indicated in Figure 10. It is to be noted that switch 56 merely energizes the magnetic clutch switch but does not complete the circuit. The circuit is actually completed when countershaft 54, by its rotation caused by the return of the beater bar, actually trips switch 44. The circuits including the machine operated switches 46 and 56 also have a manually operated switch, as 46 manual and 56 manual respectively, to assist in setting up the machine for weaving and clearing stoppages.

When the wind-up motor, which serves to wind up the entire bolt of material that has been woven, is in operation the wind-up roll 58 is moved by a chain reduction drive 159 connected to the magnetic clutch 170. When the wind-up roll has moved to a point allowing bayonet member 55 to return to its normal position the circuit is broken. The magnetic clutch is instantaneously engaged and solenoid 45 through a suitable linkage actuates brake 59 on shaft 18. It is to be noted that throughout this mechanism accurate timing is very essential and in order to actuate the parts, some of which are relatively large, it has been found desirable that the main energizing be accomplished by electric motors or air cylinders, neither one of which function instantaneously and it is for this reason that a preferred form of construction employs this solenoid releasing means actuating members of small mass to the end that accurate and exact timing can be achieved. Referring to certain structural details so that their mode of operation will be understood reference is first made to Figures 11 and 12 which illustrate the stick deflecting means employed in conjunction with the beater bar. The deflecting assembly 30 is bolted to the front face of a plurality of substantial arms 129 which are free to revolve on shaft 128. Referring to Figure 12, particularly, the guide means or cam 150 is fixedly secured to one of the arms 129 and its lower surface rides upon a roller 152, fixed to frame 10, as shown in the solid line positions of Figure 12. When the beater bar 28 makes its stick positioning movement in the direction of the arrow the guide or cam member 150 slides off of roller 152 and the condition shown in dashed line obtains where

the roller 152 no longer supports the guide cam and the weight of arms 129 and the associated elements of deflector 30 causes the unit to partially revolve to the dashed line position and thus be withdrawn from the path of the beater bar. The dashed line position of roller 152 is merely illustrative as there is no change in position of the single roller 152, but the guide cam 150 does change its position with the movement of the beater bar assembly. When the beater bar is retracted the guide cam 150 re-engages roller 152 and the condition shown in full lines in Figure 12 is restored.

Referring to Figure 13 certain of the parts that were not adequately illustrated in Figure 1 are shown in that the magnetic clutch member 170 is energized by switch 56 at the same time the cam shaft 50 is energized. From the magnetically operated clutch the power flows through an angle reduction gear 154 with an output shaft which becomes a support and drive means for one of the sprockets of the chain reduction assembly 159. It is desired to point out that the exact form of this structure is relatively immaterial, it being necessary merely to provide preferably a fixed gear ratio to get a substantial step-down in revolutions of the power shaft and this is taken care of by the gear reduction box 154. Then means must be provided to connect motor 157 to the reduction means including the chain reducer 159 and this may take the form of a magnetic clutch as illustrated or it may often be most convenient to employ other means such as a slack belt and a belt tightener for instance. Such drive means are believed to be quite well known and normally would be adapted to the work at hand by any reasonably skilled mechanic.

Referring to Figure 14 the rotative means indicated generally by the reference character 24 in Figure 1 is shown in greater detail. The arm assembly 25 is clamped to shaft 26 and the various cam units 21 are spaced by sleeves 27 disposed on the supporting shaft 26. A one way acting piston is provided in cylinder 24 and this piston is connected through a suitable piston rod to lever 25. A tension spring is further provided in order to return the piston after its power stroke. This assembly operates to turn the cams forming the shedding device which is shown in greater detail in Figures 5 and 6.

Figure 15 illustrates the mode of operating the micro-switch 46. This switch is mounted on plate 172 which is free to pivot normally on the fixed pivot 174. This pivoting is necessary in order that this whole mechanism can be swung up out of the path of the woven materials. The actuating means is the cam member 176 which engages a portion of fixed frame 10 as the whole assembly is carried to the left as viewed in Figure 15. The cam member 176 is beyond the ends of the sticks forming the woven material and of course it itself provides no interference. Switch 46 is the sensing element which senses the fact that the new stick has been passed through the stick channel and properly and fully between the proper cords C. As the stick nears the end of its travel under the impetus of the feeding rolls as 31, the end of the stick engages the resilient secondary plate 170 which is pivoted at 178 and guided through vertical and transverse movement by slot 180 and its associated pin. As the stick end is driven with considerable energy it carries with it the resilient plate 170 and raises the switch lever 182 by means of the sloping cam surface indicated at 184.

Figures 16 and 17 illustrate two switches 44 and 156 both of which are actuated by a partial revolution of shaft 54. This partial revolution is achieved by means of arm 42 and a connecting link 41 connecting it to the beater framework 40. As a result, shaft 54 is partially revolved through approximately 90° each time the beater bar moves forward in its operational cycle.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of a stick weaving loom.

Having thus disclosed the invention, I claim:

1. A stick weaving loom, comprising: a loom frame comprising guide and supporting means for a multiplicity of warp cords running lengthwise of the loom and said frame supporting spools for said cords at one end and a wind-up roller at the other end for receiving the woven material, a beater extending transversely of said frame spaced from said wind-up roller and a shedding device immediately forward of said beater and differential cord tensioning means intermediate said spools and said shedding device, said shedding device receiving said cord and said beater having a guideway to receive woof slats, power and control means for said loom for operating the same and supplemental tension means provided intermediate said tensioner and said shedding device by a pair of tension shafts extending transversely of said frame in closely spaced apart relationship and said shafts having connecting means therebetween so that the shafts rotate at the same angular speed and said cords passing around each shaft and said shafts having no external supply of power and being rotated by the force applied by said cord.

2. The subject matter of claim 1 in which said shafts have a differential in diameter of a few thousandths of an inch with the following shaft being of less diameter than the forward shaft, and said cords being wound around said shaft by passing over the following shaft and brought under and through to the right of their leading portion and then passing over the forward shaft and thereunder and brought through to the left of their leading portion thereby compensating for the lay of the cords.

3. A stick weaving loom, comprising: a loom frame comprising guide and supporting means for a multiplicity of warp cords running lengthwise of the loom and said frame supporting spools for said cords at one end and a wind-up roller at the other end for receiving the woven material, a beater extending transversely of said frame spaced from said wind-up roller and a shedding device immediately forward of said beater and differential cord tensioning means intermediate said spools and said shedding device, said shedding device receiving said cord and said beater having a guideway to receive woof slats, power and control means for said loom for operating the same and supplemental tension means provided intermediate said tensioner and said shedding device by a pair of tension shafts extending transversely of said frame in closely spaced apart relationship and said shafts having connecting means therebetween so that the shafts rotate at the same angular speed and said cords passing around each shaft and said shafts having no external supply of power and being rotated by the force applied by said cord; woof slats held in a bank disposed transverse of said loom and to one side in superposed relationship and a feeder arm therebelow which moves longitudinally relative said slats and has a needle point upper surface to act on the lowermost slat, and spring means acting on the top of the bank of slats adjacent said arm, and said arm thereby feeding slats one at a time toward said beater.

4. The subject matter of claim 3 in which there are a pair of coaxial superposed feeder rollers intermediate said bank and said beater and providing drive means for said slats fed toward said beater by said feeder arm.

5. A stick weaving loom, comprising: a loom frame comprising guide and supporting means for a multiplicity of warp cords running lengthwise of the loom and said frame supporting spools for said cords at one end and a wind-up roller at the other end for receiving the woven material, a beater extending transversely of said frame spaced from said wind-up roller and a shedding device immediately forward of said beater and differential cord tensioning means intermediate said spools and said shedding device, said shedding device receiving said cord and said beater having a guideway to receive woof slats, power and control means for said loom for

operating the same and supplemental tension means provided intermediate said tensioner and said shedding device by a pair of tension shafts extending transversely of said frame in closely spaced apart relationship and said shafts having connecting means therebetween so that the shafts rotate at the same angular speed and said cords passing around each shaft and said shaft having no external supply of power and being rotated by the force applied by said cord; said beater having a slot passing transversely of said loom for receiving said slats which is open toward said wind-up rollers, and a deflector plate supported by said frame to assume a position in front of said slot during the period that strips are fed therein and having a series of deflector camming portions extending away from said slot as they extend in the direction from which said slats are fed thereby directing misaligned slats back into said slot.

6. A stick weaving loom comprising: a loom frame comprising guide and supporting means for a multiplicity of warp cords running lengthwise of the loom and said frame supporting spools for said cords at one end and a wind-up roller at the other end for receiving the woven material, a beater extending transversely of said frame spaced from said wind-up roller and a shedding device immediately forward of said beater and differential cord tensioning means intermediate said spools and said shedding device, said shedding device receiving said cord and said beater having a guideway to receive woof slats, power and control means for said loom for operating the same and supplemental tension means provided intermediate said tensioner and said shedding device by a pair of tension shafts extending transversely of said frame in closely spaced apart relationship and said shafts having connecting means therebetween so that the shafts rotate at the same angular speed and said cords passing around each shaft and said shafts having no external supply of power and being rotated by the force applied by said cord, said shedding including a plurality of juxtaposed heddle cams and include guide plates and two types of cam plates interfingered with the guide plates, cam plates having chordal portions removed at different radial locations located in the two types at different radial points and the cords partly being supported by each type of cam plates and means for timed shifting of the shedding cam about the axis thereof so that the chordal portions will act alternately on the cords for raising and lowering the same.

7. A stick weaving loom, comprising: a loom frame comprising guide and supporting means for a multiplicity of warp cords running lengthwise of the loom and said frame supporting spools for said cords at one end and a wind-up roller at the other end for receiving the woven material, a beater extending transversely of said frame spaced from said wind-up roller and a shedding device immediately forward of said beater and differential cord tensioning means intermediate said spools and said shedding device, said shedding device receiving said cord and said beater having a guideway to receive woof slats, power and control means for said loom for operating the same and supplemental tension means provided intermediate said tensioner and said shedding device by a pair of tension shafts extending transversely of said frame in closely spaced apart relationship and said shafts having connecting means therebetween so that the shafts rotate at the same angular speed and said cords passing around each shaft and said shafts having no external supply of power and being rotated by the force applied by said cord said power and operating means including a trigger mechanism at the opposite end of said beater from which said slats are fed and disposed to be struck by said slats when they are fed fully into position and said trigger when struck initiating automatic, timed operation of said beater, shedding device and wind-up roll.

8. The subject matter of claim 7 in which said trigger has electrical control means, and a motor and a power

shaft connected to the motor by a belt and a belt tightener controlled by said electrical means, said power shaft having a plurality of cams thereon and an air cylinder providing power means for operating said beater and a second air cylinder providing power for operating said shedding device and control means on said air cylinders operated by fingers riding on said cams.

9. A stick weaving loom, comprising: a loom frame comprising means for supporting and guiding a multiplicity of warp cords running lengthwise of the loom and said frame supporting feeding and differential tensioning means for said cords at one end and a wind-up roller at the other end for receiving the woven products, a beater extending transversely of said frame next to said wind-up roller and a shedding device forward of said beater, said shedding device receiving said cord and said beater having a guideway to receive woof slats, power and control means operative to operate said loom at least partially automatically and power and control means including a motor, a drive shaft, power transmitting means connecting said motor to said drive shaft, a control shaft and a power coupling means thereon, solenoid means acting to move said control shaft to tighten said belt, a plurality of control cams on said drive shaft, power means for said shedding device and beater and control fingers for said power means riding on said control cams whereby said shedding device and beater are operated responsive to rotation of said drive shaft and means for initiating operation of said solenoid responsive to the stage of the weaving operation.

10. The subject matter of claim 9 in which there is a timing disc on said drive shaft and connecting means between said timing disc and said control shaft operative to disconnect said power coupling means until said solenoid is re-energized and means driving said wind-up roller upon said withdrawal of said belt tightener.

11. A stick weaving loom, comprising: a loom frame comprising means for supporting and guiding a multiplicity of warp cords running lengthwise of the loom and said frame supporting feeding and differential tensioning means for said cords at one end and a wind-up roller at the other end for receiving the woven products, a beater extending transversely of said frame next to said wind-up roller and a heddle forward of said beater, said

shedding device receiving said cord and said beater having a guideway to receive woof slats, power and control means operative to operate said loom at least partially automatically and power and control means includes a series of cams on a common shaft initiating operation of said beater, shedding device and wind-up roller responsive to the contour of said cams.

12. The subject matter of claim 11 in which there is a motor and said common shaft being connected to said motor by a belt and a belt-tightener for initiating rotation of said common shaft when it operates on said belt, and trigger means for said belt-tightener responsive to a slat reaching its proper position in said beater.

13. A stick weaving loom, comprising: a loom frame comprising means for supporting and guiding a multiplicity of warp cords running lengthwise of the loom and said frame supporting feeding and differential tensioning means for said cords at one end and a wind-up roller at the other end for receiving the woven products, a beater extending transversely of said frame next to said wind-up roller and a heddle forward of said beater, said shedding device receiving said cord and said beater having a guideway to receive wood slats, power and control means operative to operate said loom at least partially automatically and said beater has a guideway passing transversely of said loom for receiving said slats which is open toward said wind-up roller, and a deflector plate supported by said frame to assume a position in front of said slot as strips are fed therein and having a series of deflector camming surfaces disposed to direct misaligned slats back into said slot and means for moving said deflector plate from in front of said slot.

References Cited in the file of this patent

UNITED STATES PATENTS

57,898	Hasecoster	Sept. 11, 1866
624,658	Kelly	May 9, 1899
763,628	Petersen	June 28, 1904
819,742	Draper	May 8, 1906
1,703,276	Lloyd	Feb. 26, 1929
2,480,395	Clark	Aug. 30, 1949