July 8, 1958 R. P. HEAD 2,842,164

VACUUM WEFT HOLDER FOR LOOMS

Filed Sept. 13, 1956 4 Sheets-Sheet 1

FIG-2

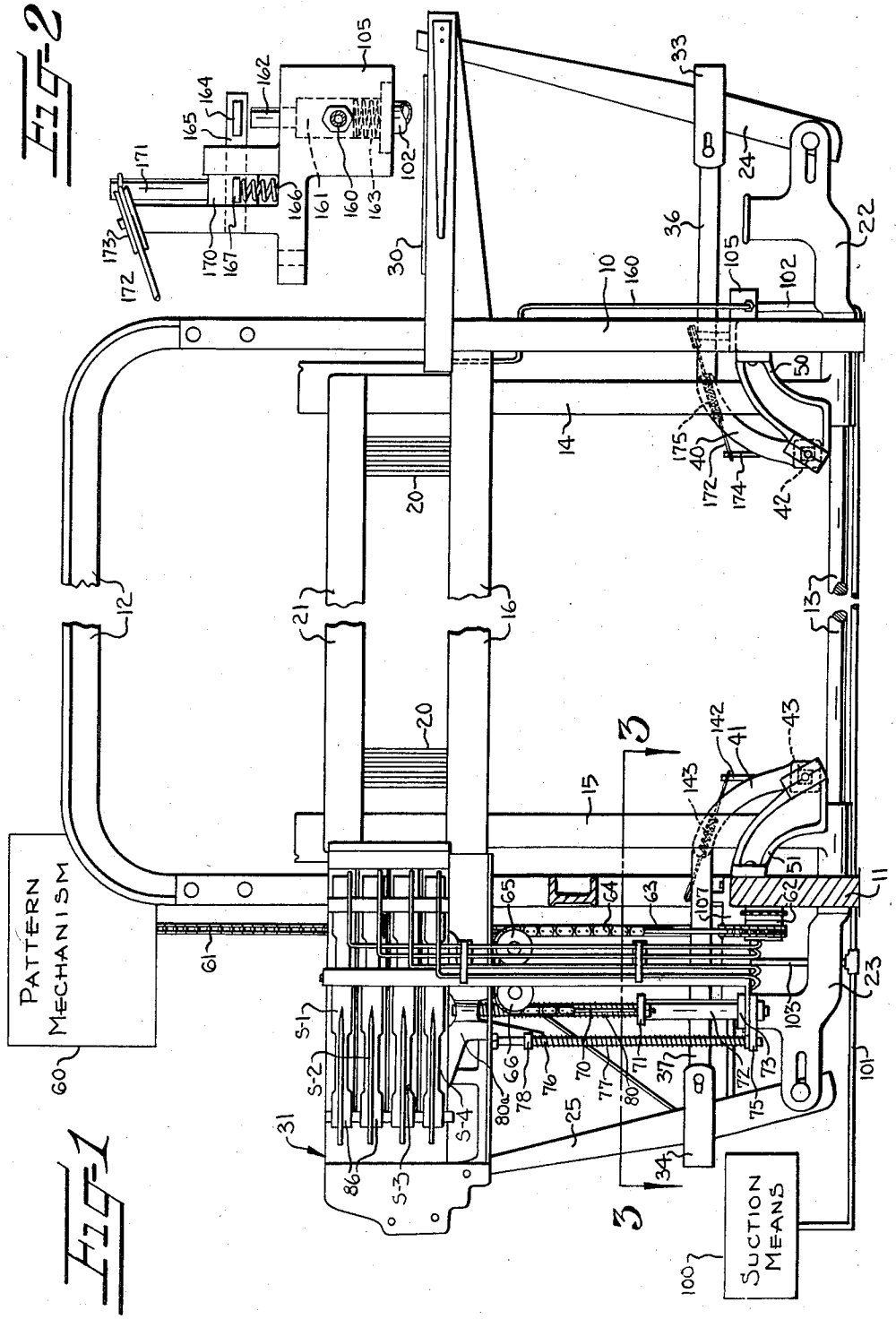


FIG-1

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VACUUM WEFT HOLDER FOR LOOMS

Filed Sept. 13, 1956 4 Sheets-Sheet 2

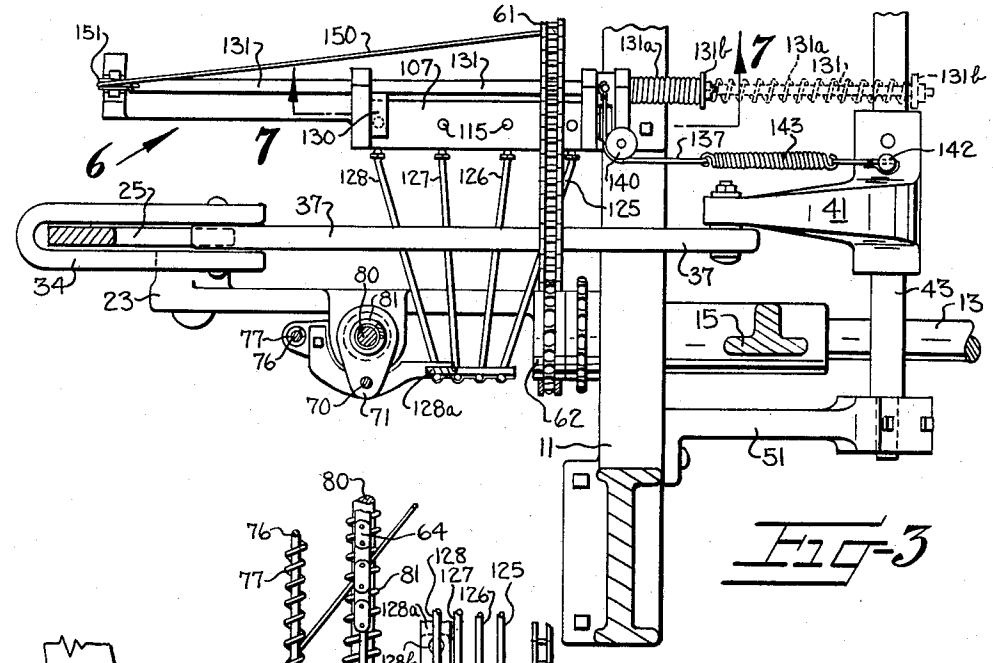


Fig-3

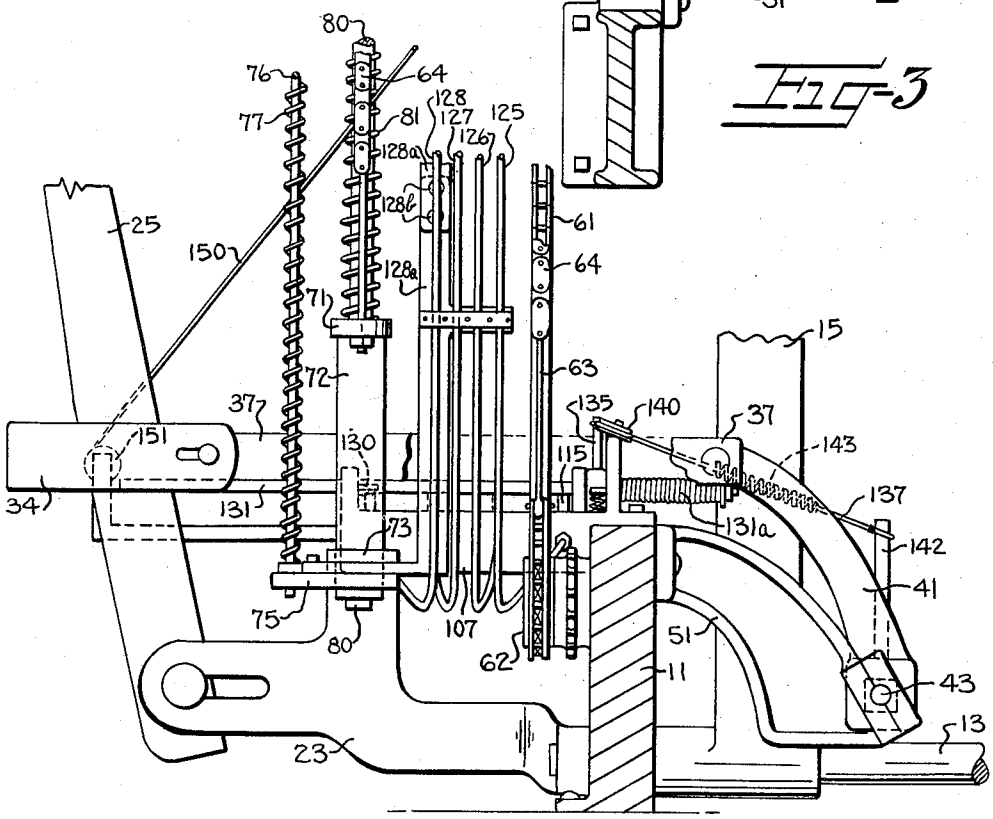


Fig-4

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VACUUM WEFT HOLDER FOR LOOMS

Filed Sept. 13, 1956 4 Sheets-Sheet 3

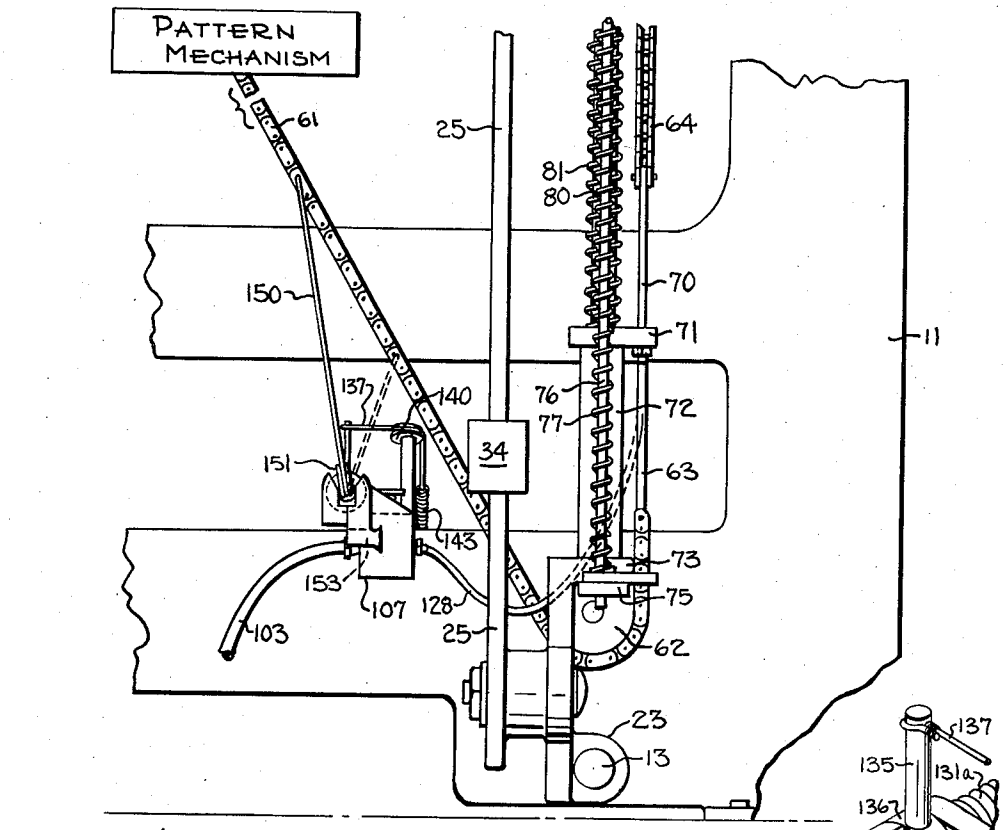


Fig-5

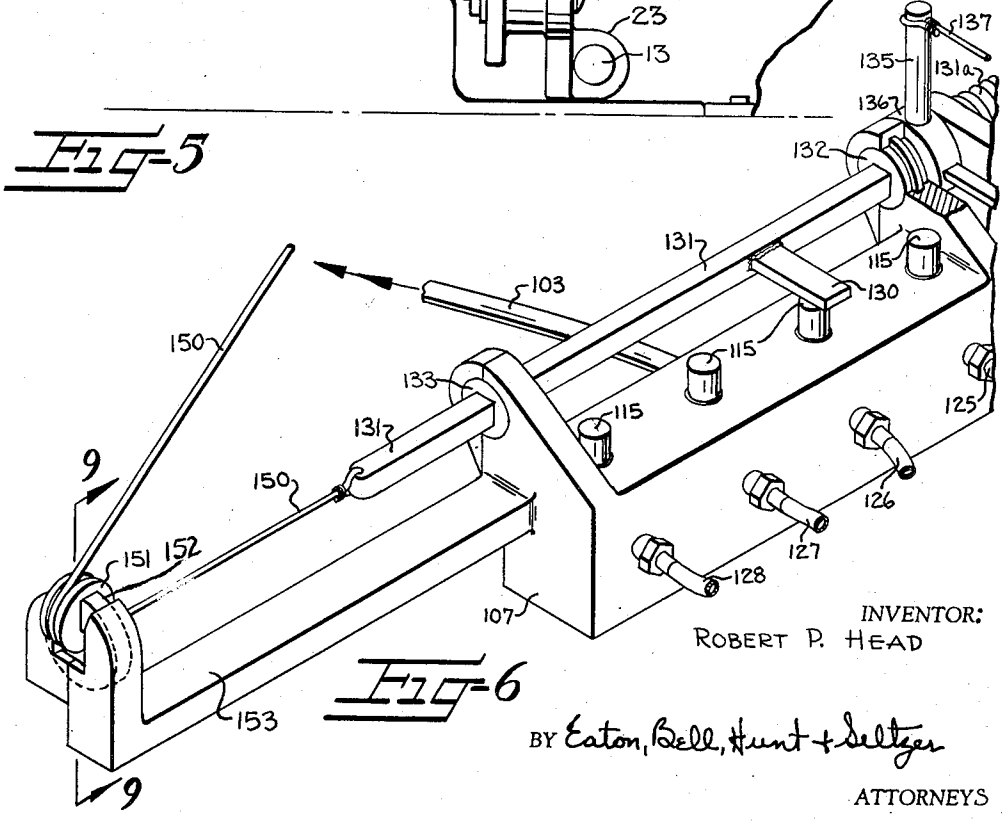


Fig-6

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July 8, 1958 R. P. HEAD 2,842,164

VACUUM WEFT HOLDER FOR LOOMS

Filed Sept. 13, 1956 4 Sheets-Sheet 4

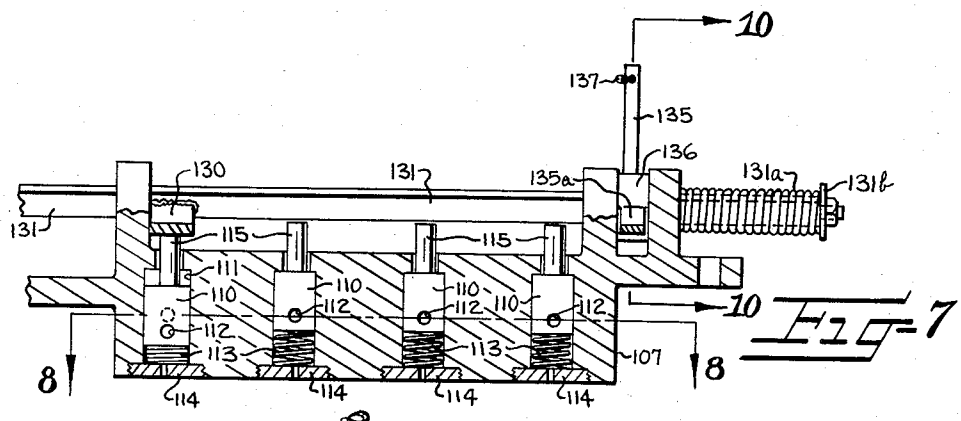


Fig-7

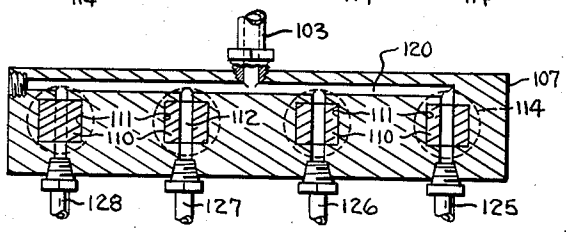


Fig-8

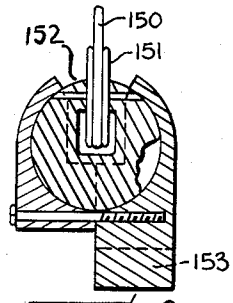


Fig-9

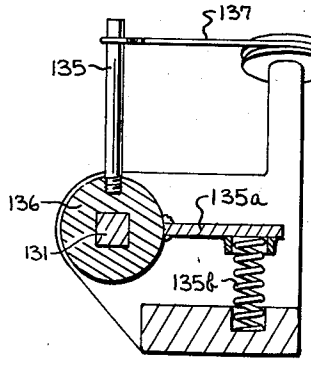


Fig-10

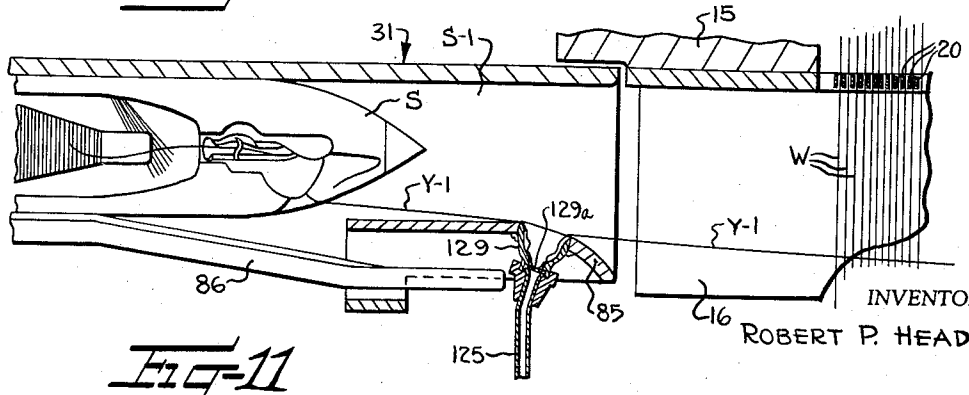


Fig-11

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2,842,164

VACUUM WEFT HOLDER FOR LOOMS

Robert P. Head, Columbus, N. C.

Application September 13, 1956, Serial No. 609,605

18 Claims. (Cl. 139—170.3)

This invention relates generally to an improved attachment for multiple and single shuttle looms for holding and tensioning the idle weft or filling yarns which extend from the adjacent selvage at both sides of the cloth to the shuttles in the respective shuttle boxes. This invention is of particular value in a loom which has a vertically movable multiple compartment shuttle box at one end and will hold the weft or filling yarns extending from the idle shuttles in a taut position and adjacent one side of the shuttle boxes to prevent the idle weft yarn from being woven, becoming entangled with each other, or from being drawn into the fabric by an outgoing shuttle.

In the weaving of cloth, using a multiple shuttle box loom, a shuttle is thrown across the lay from one of the multiple compartment shuttle boxes into a single shuttle box at the opposite side of the lay and a filling or weft yarn is left in the open shed formed by the warp yarns. As the lay makes its forward stroke, the shed is closed and the weft or filling yarn left by the shuttle is beat-up by the reed to form another pick of fabric with each forward stroke of the lay. In weaving of this type, wherein one or both ends of the lay are provided with multiple and vertically movable shuttle boxes, the weft yarn extending from the selvage of the fabric to the shuttles sometimes has too much slack left therein as the shuttle is boxed. These slack weft yarns present a serious problem when shuttles are thrown from the multiple shuttle box and during raising and lowering of the multiple shuttle box. During raising and lowering of the multiple shuttle box the slack weft yarns become entangled with each other, drop down in front of the lower shuttle and are drawn into the cloth or broken as the lower shuttle is thrown across the lay, resulting in bad cloth or downtime for the loom.

It is therefore a primary object of this invention to provide a vacuum means for engaging and holding each of the weft yarns, extending from the respective shuttles to the edge or selvage of the fabric, under a slight tension as soon as the shuttles are boxed. With the idle weft yarns thus held taut, any one of the shuttles may be thrown across the lay without becoming entangled with previously cast weft yarns.

It is another object of this invention to provide a vacuum holding means, adjacent each shuttle box at both ends of the lay, for holding the yarn extending from the shuttle to the fabric edge under a slight tension so as to prevent any looping or curling upon itself by the weft yarn as the shuttle is boxed and to thereby provide a tight closely woven selvage on the cloth.

The vacuum weft yarn holding apparatus will also cause the weft yarn layed in the open shed of the cloth formed by the warp yarns to be pulled slightly and provide a straight weft or filling yarn just prior to the beat-up stroke to thus eliminate kinks, curls and loose places and provide a uniform tension throughout the length of the weft yarn. Thus, it is possible to weave a better fabric while eliminating many seconds and bad portions

of cloth and providing a substantial saving in finishing and subsequent operations such as sewing, burling, inspecting and printing of the cloth.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of one type of loom with which this improved vacuum weft holder may be associated, with the central portion of the loom broken away;

Figure 2 is an enlarged elevation of the vacuum valve mechanism shown in the lower right-hand corner of Figure 1 being removed from the loom;

Figure 3 is an enlarged sectional plan view taken substantially along the line **3—3** in Figure 1;

Figure 4 is an enlarged fragmentary elevation of the lower left-hand corner of Figure 1;

Figure 5 is a fragmentary side elevation, looking at the left-hand end of Figure 4;

Figure 6 is an isometric view of the vacuum valve mechanism at the left-hand end of the loom removed from the loom and being taken in the direction of the arrow **6** in Figure 3;

Figure 7 is an enlarged longitudinal sectional view of a portion of the vacuum valve, taken substantially along the line **7—7** in Figure 3 and removed from the loom;

Figure 8 is a longitudinal sectional plan view taken substantially along the line **8—8** in Figure 7;

Figure 9 is a transverse vertical sectional view taken substantially along the line **9—9** in Figure 6;

Figure 10 is an enlarged transverse vertical sectional view taken substantially along the line **10—10** in Figure 7;

Figure 11 is a somewhat schematic sectional plan view through one of the shuttle box compartments and showing the front end of a shuttle and one of the vacuum weft holding tubes attached adjacent the mouth of the compartment.

Referring more specifically to the drawings, the loom has respective right-hand and left-hand side frame members **10** and **11** bridged at their upper ends by the usual harness frame **12**. The loom also has a rocker shaft **13**, opposite ends of which are mounted for reciprocation in the side frames **10** and **11** and which is caused to reciprocate by the usual rocking mechanism, not shown, to oscillate respective right-hand and left-hand swords **14** and **15**. The lower ends of the swords **14**, **15** are fixed on the rocker shaft **13** and the upper ends thereof support the usual lay **16**, reed **20** and reed cap **21**.

The rocker shaft **13** has, fixed thereto and at opposite ends thereof, respective right and left-hand rocker arms **22** and **23** which oscillatably support the lower end of a pair of picker sticks **24** and **25**, the respective upper ends of which are positioned adjacent the outer ends of a single shuttle box **30** and a multiple shuttle box **31**. The medial portions of the picker sticks **24**, **25** are surrounded by strap members **33** and **34**, the inner ends of which are pivotally secured to the outer ends of sweep sticks **36**, **37**. The innermost ends of the sweep sticks **36**, **37** are pivotally secured to the upper ends of respective picking sweep arms **40** and **41** (Figures 1, 3 and 4), the opposite ends of which are fixed to respective picking shafts **42** and **43**. The forward ends of the picking shafts **42**, **43** are reciprocally mounted in picking shoes **50**, **51**, suitably secured to the respective side frames **10** and **11** of the loom. During weaving, the picking shafts **42**, **43** are reciprocated, in a well known and conventional manner by suitable picking mechanisms, not shown, to move the upper ends of the picker sticks **24**,

25 and alternately throw a shuttle from one side of the loom to the other between each beat-up stroke of the lay.

In a conventional loom of the type shown, wherein one end of the lay is equipped with a multiple shuttle box having individual shuttle boxes or compartments S–1, S–2, S–3 and S–4 with a shuttle S in each compartment and the opposite end is provided with a single shuttle box, a box motion pattern mechanism of any conventional type indicated schematically at 60 in Figures 1 and 5 is provided for selecting the proper shuttle box in the multiple shuttle box to be placed in alinement with the lay 16. The pattern mechanism 60 is adapted to raise or lower the multiple shuttle box 31 according to the desired pattern so that the desired compartment is placed at the right vertical position and the shuttle positioned therein may be thrown across the lay and into the box 30 by the picker stick 25 and returned to its original box by the picker stick 24 at the opposite end of the lay 16.

The mechanism for controlling the vertical position of the various shuttle boxes S–1 through S–4 in the multiple shuttle box 31 includes a chain 61 (Figures 1, 3, 4 and 5), one end of which is attached to and movable by the pattern mechanism 60. The chain 61 extends downwardly and partially surrounds a sprocket 62 rotatably mounted in the side frame 11. From the sprocket 62 the chain 61 extends upwardly and has one end of a connecting link 63 connected thereto, the upper end of which is connected to the lower end of a chain 64 which passes upwardly over a pair of grooved pulleys 65, 66 (Figure 1) rotatably mounted on a bracket extending downwardly from and suitably secured to the lower edge of the lay 16. The lower end of the chain 64 has one end of a connecting link 70 secured thereto and the lower end of which is fixed in a collar 71, the lower side of which is fixed on the upper end of a guide 72. The guide 72 is slidably mounted for vertical movement in a horizontal portion 73 of the rocker arm 23, heretofore described. The lower side of the portion 73 has one end of an outwardly extending arm 75 fixed thereto and the free end of which guides and supports a guide rod 76, the upper end of which is fixed on the lay 16. A compression spring bears against the plate 75 while the upper end thereof bears against an adjustable collar 78 surrounding the rod 76. The spring 77 will thus normally urge the multiple shuttle box 31 downwardly against the pull of the chain 64. A second guide rod 80 is provided, the upper end of which is fixed in a bracket 80*a* on the lower edge of the multiple shuttle box 31 and the lower portion of which is slidably mounted in the guide 72. The rod 80 is surrounded by a compression spring 81, the lower end of which engages the collar 71 and the upper end of which bears against the bracket 80*a* which supports the upper end of the rod 80. The spring 81 acts as a safety or overriding member as the shuttle box 31 is raised, in a conventional manner.

When it is desired to lower the shuttle box 31 vertically, the pattern mechanism 60 will operate to release the chain 61 so that the chain may move the desired distance to thereby move the chain 64 across the pulleys 65, 66 to thus lower the guide 72, rod 80 and the multiple shuttle box 31 to the desired position so that the desired one of the boxes S–3, S–2 or S–1 is lowered to the proper level, in alinement with the lay 16.

Each of the shuttle boxes S–1 through S–4 in the multiple shuttle box 31 is provided with respective conventional shuttle guard plates 85 (Figure 11) and shuttle binder plates 86 for guiding the shuttle S as it enters the shuttle box and holding the shuttle S in position after it is boxed. All of the parts heretofore described are conventional parts of a loom of the type which has multiple shuttles at one end and a single shuttle box at the opposite end and it is with this type of loom that this invention is particularly adapted to be associated, although it is to be understood that this type of vacuum weft holding apparatus could be utilized on any type of loom having, for instance, single shuttle boxes at opposite ends or multiple shuttle boxes at opposite ends.

The improved vacuum weft holding apparatus comprises any suitable suction means 100, such as a suitable vacuum pump or existing suction lines already available in the textile plant in which this loom is installed, a main vacuum line 101 running beneath the loom and branch vacuum lines 102 and 103 adjacent respective end walls 10 and 11 of the loom. The branch pipe 102 leads to a first valve housing 105 (Figures 1 and 2) suitably secured to the side frame 10 of the loom. The branch pipe 103 leads to one side of a second multiple valve housing 107 (Figures 1 through 8) suitably secured on the side frame 11 of the loom.

The second valve housing 107 is provided with a plurality of, and in this case four, identical square shank valve operating pistons 110 mounted for vertical sliding movement in bores 111 in the valve housing 107. The pistons 110 are provided with drilled bores or passageways 112 therein. The pistons 110 are normally urged upwardly in Figure 7, by compression springs 113 and the lower end of the bores 111 are closed by threaded plugs 114 which also support the springs 113. The pistons 110 are each provided with a stem or operating pin 115 which extends outwardly of the valve housing 107 and is adapted to be, at times, depressed to move the pistons 110 from the normally open position to a closed position.

The vacuum line 103 enters the valve housing 107 (Figure 8) and connects with a main valve bore 120 with branches leading to each of the pistons 110 and which branches line up, at times, with the openings 112 in the pistons 110 and provides a passageway for the vacuum to respective vacuum lines 125, 126, 127 and 128. The opposite ends of the vacuum lines 125 through 128 lead to nozzles 129 suitably secured in the respective guard plates 85 adjacent the mouths of each of the shuttle boxes S–1, S–2, S–3 and S–4. In Figure 11, the nozzle 129 is shown as having a wire screen 129*a* fixed therein, but it should be understood that this screen could be omitted without departing from the spirit of the invention. The vacuum lines 125 through 128 are supported intermediate their ends by a bracket 128*a*, one end of which is fixed to the multiple shuttle box 31 and the opposite end of which is fixed on the plate 75 (Figures 1 and 4). The bracket 128*a* may be made in two parts which overlap (Figure 4) and are adjustably secured together as at 128*b*.

By referring to Figure 7, it will be noted that the pistons 110 are normally urged upwardly to the open position by the springs 113 so that the vacuum supplied to the line 103 and the valve bore 120 will have an opening through the openings 112 in the pistons 110 to the respective lines 125 through 128. Thus, vacuum is normally applied to the nozzles 129 in each of the shuttle guard plates 85 to draw in a yarn adjacent thereto and to take up any excess slack therein, as shown in Figure 11, to thus keep the yarn taut across the lay of the loom at all times that the shuttle S is boxed. When one of the shuttles S is thrown from one side of the lay to the other, the vacuum at the mouth of the proper shuttle box is cut to release the yarn being held by a mechanism to be later described.

The means for actuating the pistons 110 includes a piston actuating lever 130, the inner end of which is fixed on a piston actuating shaft 131, which in this case, is square in cross section (Figure 6). The shaft 131 is mounted for oscillation in bearing members 132 and 133 oscillatably mounted in the valve housing 107 and in which the shaft 131 has longitudinal sliding movement for purposes to be later described. The shaft 131 is caused to rock or oscillate by a crank lever 135 (Figures 6 and 10), the lower end of which is fixed in a collar 136, fixed on and surrounding the shaft 131. A lever 135*a* is fixed, at one end, on the collar 136 and the oppo-

site end thereof is engaged by the upper end of a compression spring 135*b*, the lower end of which is seated in the valve housing 107 (Figure 10). The upper free end of the lever 135 is engaged by one end of an actuating cable 137 which extends from the lever 135, partially surrounds a pulley 140 and the opposite end of which is fixed on an upstanding picking lever 142 (Figures 3 and 4). The cable 137 may be provided with a tension spring or other type of overriding resilient means 143 intermediate its ends. The lower end of the picking lever 142 is fixed in the picking sweep arm 41 and any time that the picking sweep arm 41 operates, which is every time the picker stick 25 is thrown forward in any of the multiple shuttle boxes S–1 through S–4, the cable 137 will be pulled to move the lever 135 in a clockwise direction, in Figure 10, and cause the shaft 131 to be turned. When the shaft 131 is turned, the free end of the lever 130 will be lowered to engage one of the operating pins 115 over which the lever 130 is positioned. As the operating pin 115 is lowered by the lever 130, the corresponding piston 110 will be lowered to and close off the passage of the vacuum from the vacuum line 103 to any one of the vacuum lines 125 through 128.

Thus, each time that the picker stick 25 is thrown forward in the respective shuttle boxes S–1 through S–4, the vacuum line connected to the shuttle box in vertical alinement with the lay 16 will be shut off and allow the yarn to be released by the respective vacuum line as the shuttle leaves the box to travel across the lay 16.

Longitudinal movement of the shaft 131 is effected by the mechanism which operates the vertical height of the shuttle boxes S–1 through S–4 through the medium of a flexible linkage or cable 150 (Figure 6), one end of which is connected to one end of the shaft 131 and a compression spring 131*a* surrounding the opposite end of the shaft 131. One end of the spring 131*a* (Figures 3 and 7) bears against the valve housing 107 and the opposite end bears against the shaft 131 by a washer 131*b* fixed on the shaft 131. The spring 131*a* urges the shaft 131 to the dotted line position shown in Figure 3. The cable 150 partially surrounds a pulley 151 rotatably mounted in an oscillatable bearing 152 mounted in a supporting arm 153, the free end of which extends from and the inner end of which is integral with the valve housing 107. The cable 150 extends upwardly in Figures 1, 4 and 5 and the opposite end thereof is fixed on the chain 61 extending from the pattern mechanism 60.

Thus, as the pattern mechanism controls the vertical movement of the chain 61 in the usual manner, the upper end of the cable 150 will be raised or lowered with the chain 61 and multiple shuttle box 31, and after changing direction around the pulley 151 will position the lever 130 over the proper pins 115 of the pistons 110. The compression spring 131*a* surrounding the shaft 131 normally keeps the cable 150 taut as well as urges the shaft 131 from left to right in Figures 3 and 6 as the end of the cable 150 is moved from the solid line position to the dotted line position, in Figure 5, or to any intermediate position.

A vacuum line 160 extends from one side of the valve housing 105 to the race plate of the lay 16 and adjacent the mouth of the shuttle box 30. The race plate may be provided with a nozzle similar to the nozzles 129. The vacuum in the line 160 is controlled by the first valve housing 105, fixed on the side frame 10 of the loom (Figures 1 and 2). The valve housing 105 is provided with a piston 161, similar to the pistons 110 in the valve housing 107 and has an actuating pin 162 normally urged upwardly by a compression spring 163. The pin 162 is adapted to, at times, be engaged by one end of a lever 164, the inner end of which is fixed on an oscillatable shaft 165. The shaft 165 is supported in upstanding portions of the first valve housing 105 and is urged upwardly and away from the pin 162 of the piston 161 by a compression spring 166, the lower end of which is seated in the first valve housing 105 and the upper end of which engages an outwardly extending lever 167 fixed on a collar 170 surrounding and fixed on the shaft 165. The collar 170 also has the lower end of a lever 171 fixed therein, the upper end of which is engaged by one end of a cable 172 which extends therefrom and partially surrounds a pulley 173 rotatably mounted on an upstanding portion of the first valve housing 105. The cable 172 extends from the pulley 173 to a second upwardly projecting picking lever 174, the lower end of which is fixed in the picking sweep arm 40 and operates with the picking sweep arm 40 each time the picking shaft 42 is operated in a conventional manner. A tension spring 175 (Figure 1) may be provided intermediate the ends of the cable 172 to provide resilient overriding means for the cable 172.

Thus, each time that the picker stick 24 throws the shuttle from the shuttle box 30 to the opposite side of the loom, the vacuum is cut off of the line 160 by a cable 172 being pulled to thus pull the upper end of the lever 170, in Figure 2, towards the observer and lower the lever 164 into engagement with the pin 162 of the piston 161 to thus cut off the vacuum from the line 102 to the line 160 as the shuttle S leaves the shuttle box 30. Thus the yarn by being held taut is released as the shuttle begins its flight from left to right in Figure 1 from the shuttle box 30 into either one of the respective shuttle boxes S–1 through S–4.

It is thus seen that, there has been provided a suction mechanism for holding the inactive yarns leading from the boxed shuttles to the edge or selvage of the cloth to prevent this yarn from being ensnared and to tighten the yarn as soon as it is laid across the open shed of the loom. A control mechanism is also provided for automatically selectively cutting off the vacuum in the line leading to the shuttle box which has it shuttle thrown across the lay as the shuttle leaves the box in timed relation to the picking mechanism of the loom and which mechanism may be easily attached to existing looms to prevent bad selvages on the yarns as well as to assist the conventional filling detector in detecting a loose or broken filling or weft yarn as the shuttle is thrown from one side of the loom to the other in a weaving operation.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. In a loom having a reciprocable lay, a vertically movable multiple shuttle box at one end of said lay, a single shuttle box at the opposite end of said lay, shuttles movable between said shuttle boxes, picker sticks at opposite ends of said lay for throwing said shuttles across said lay while leaving a trailing yarn laid across said lay and means for alternately actuating said picker sticks; the combination of a first vacuum control means for engaging the trailing yarn from shuttles adjacent the mouth of the shuttle box at one end of said lay and a second vacuum control means for engaging the trailing yarn from said shuttles adjacent the mouths of the shuttle boxes at the opposite end of said lay.

2. In a multiple shuttle loom having a lay and also having a multiple compartment shuttle box vertically movable to a plurality of positions to bring a selected compartment opposite an end of said lay, shuttles in each of said compartments, picker sticks at opposite ends of said lay for throwing said shuttles from one side of said lay to the other while leaving a trail of yarn across said lay, a vacuum weft holder for holding and separating the portions of the weft yarn which extend from the adjacent selvage of the cloth being woven to the respective compartment of the shuttle box comprising, vacuum supply lines to the individual compartments of the shut-

tle box, first control means for selecting one of said vacuum supply lines to render inoperative and second control means for rendering the selected vacuum supply line inoperative.

3. In a multiple shuttle loom having a lay and also having a multiple compartment shuttle box vertically movable by pattern controlled means to a plurality of positions to bring a selected respective compartment in alinement with an end of said lay, shuttles in each of said compartments, picker sticks at opposite ends of said lay for throwing said shuttles from one side of said lay to the other while leaving a trail of yarn across said lay, a vacuum weft holder for holding and separating the portions of the weft yarn which extend from the adjacent selvage of the cloth being woven to the respective compartment of the shuttle box comprising vacuum supply lines adjacent the mouths of the individual compartments of the shuttle boxes, first valve control means operable by said pattern controlled means for selecting one of said vacuum supply lines to render said line inoperative and second control means controlled by movement of said picker sticks for rendering the vacuum supply line selected by said first valve control means inoperative.

4. In a loom having a lay, a multiple compartment shuttle box vertically movable by pattern controlled means to a plurality of positions to bring a selected respective compartment in alinement with said lay at one end, a single shuttle box at the opposite end of said lay, shuttles in each of said compartments, picker sticks at opposite ends of said lay for throwing said shuttles from one side of said lay to the other while leaving a trail of yarn across said lay; the combination of vacuum supplied adjacent the mouth of said shuttle box, means operable by action of said picker sticks for rendering the vacuum adjacent any one of said shuttle boxes inoperative and means operable by said pattern controlled means for selecting one of said shuttle boxes to render the vacuum inoperative.

5. In a multiple shuttle box loom having an oscillatable lay for weaving fabric, said loom also having a vertically movable multiple shuttle box at one end of said lay provided with at least two compartments for accommodating corresponding shuttles, a single shuttle box at the opposite end of said lay, pattern controlled means for controlling vertical movement of said multiple shuttle box, picker sticks for throwing a shuttle across said lay, an improved vacuum weft holder comprising a vacuum supply line to each of said shuttle boxes, a multiple valve mechanism for selectively closing any one of said vacuum supply lines to said multiple shuttle box, a single valve mechanism for closing the vacuum supply line to said single shuttle box and the closing of both valve mechanism being controlled by actuation of said picker sticks.

6. In a multiple shuttle box loom having an oscillatable lay for weaving fabric, a single shuttle box at one end of the lay, a vertically movable multiple shuttle box at the other end of said lay provided with at least two compartments for accommodating corresponding shuttles, a single shuttle box at the opposite end of said lay, pattern controlled means for controlling vertical movement of said multiple shuttle box, a picker stick adjacent each end of said lay for throwing a shuttle across said lay, an improved vacuum weft holder comprising a vacuum supply line to each compartment of said multiple shuttle box, a first multiple valve mechanism for selectively closing one of said vacuum supply lines, a single vacuum supply line to said single shuttle box, and a second valve mechanism for closing the vacuum supply line to the single shuttle box.

7. In a structure according to claim 6 wherein the first multiple valve mechanism is operated by movement of one picker stick and the second valve mechanism is operated by movement of the other picker stick.

8. In a loom having an oscillatable lay for weaving fabric, a single shuttle box at one end of the lay, a vertically movable multiple shuttle box at the opposite end of said lay provided with at least two compartments for accommodating corresponding shuttles, pattern controlled means for moving selected compartments in alinement with the lay, picker sticks for throwing a shuttle across the lay, an improved vacuum weft holder comprising a vacuum supply line to the mouth of each compartment of said shuttle box, a valve housing having a plurality of valves, a lever selectively engageable with any one of said valves, said pattern controlled means being operable to position said lever above the selected valve and movement of said picker sticks causing actuation of said lever and said selected valve.

9. In a loom for weaving fabric having an oscillatable lay, a vertically movable multiple shuttle box on at least one end of said lay and provided with top, middle and lower compartments for carrying respective shuttles, bobbins in said shuttles for carrying a weft yarn across said lay during the formation of said fabric, a pattern control mechanism for positioning any one of the compartments of the multiple shuttle box in vertical alinement with the upper surface of said lay and picker sticks for moving said shuttles from one end of said lay to the other, an improved vacuum weft holder comprising vacuum supply lines connected to said compartments, a valve mechanism for controlling the flow of vacuum in said lines, said valve mechanism containing a number of valves equal to the number of vacuum supply lines, an actuating member for said valves, means for positioning said actuating member in alinement with selected ones of said valves and means for operating said actuating member to actuate said valve.

10. In a loom for weaving fabric having an oscillatable lay, a vertically movable multiple shuttle box on one end of said lay and provided with top, middle and lower compartments for carrying respective shuttles, bobbins in said shuttles for carrying a weft yarn across said lay during the formation of said fabric, a single shuttle box at the other end of said lay, a pattern control mechanism for positioning any one of the compartments of the multiple shuttle box in vertical alinement with the upper surface of said lay and a movable picker stick at each end of the lay for moving said shuttles from one end of said lay to the other, an improved vacuum weft holder comprising, a first vacuum supply line connected to said single shuttle box, a first valve mechanism for controlling the flow of vacuum in said first supply line, second vacuum supply lines connected to each compartment of said multiple shuttle box, a second valve mechanism for controlling the flow of vacuum in said second supply lines, said first valve mechanism containing a single valve, said second valve mechanism containing valves equal in number to the number of vacuum supply lines, a multiposition actuating member for the second valve mechanism, means for selectively positioning said actuating member in alinement with any one of the valves in said second valve mechanism and means for operating said actuating member to actuate said valve.

11. In a structure according to claim 10 wherein the means for selectively positioning said actuating member comprises a sliding shaft mounted in said second valve mechanism, resilient means at one end of said shaft for moving said shaft in one direction, and flexible linkage at the other end of said shaft connected to said pattern control mechanism for moving said shaft in the opposite direction and for controlling the movement of said shaft by said resilient means.

12. In a structure according to claim 10 wherein the means for operating the actuating member comprises a crank lever adapted to rock said actuating member to one position, resilient means associated with said crank lever to rock said actuating member back to its original position, and flexible linkage connected at one end to said

crank lever and at the other end to the mechanism for moving said picker stick.

13. In a loom for weaving fabric having an oscillatable lay, a vertically movable multiple shuttle box on at least one end of said lay and provided with top, middle and lower compartments for carrying respective shuttles, bobbins in said shuttles for carrying a weft yarn across said lay during the formation of said fabric, a pattern control mechanism for positioning any one of the compartments of the multiple shuttle box in vertical alinement with the upper surface of said lay and a movable picker stick at each end of the lay for moving said shuttles from one end of said lay to the other, an improved vacuum weft holder comprising, individual vacuum supply lines connected adjacent the mouth of each of said compartments, a valve mechanism for controlling the flow of vacuum in the supply lines, said valve mechanism containing valves equal in number to the number of vacuum supply lines, an actuating member for actuation of the valves in the valve mechanism, means controlled by said pattern control mechanism for positioning said actuating member in alinement with any selected one of the valves in said valve mechanism, means controlled by movement of the picker stick for operating said actuating member to actuate said valves, and said valves each comprising a piston having a passageway therein, a stem on said piston, and resilient means normally urging the valves to open position.

14. In a multiple shuttle loom provided with a lay, a pattern controlled vertically shiftable multiple shuttle box at one end of the lay, a single shuttle box at the opposite end of the lay, separate compartments in said vertically shiftable shuttle box, and a movable picker stick at each end of the lay for moving shuttles from one end of said lay to the other; the combination of first vacuum nozzles adjacent the mouth of each compartment of said multiple shuttle box, a second vacuum nozzle adjacent the mouth of the single shuttle box, a multiple valve housing, vacuum supply lines connecting said first vacuum nozzles and the multiple valve housing, individually operable valves in said valve housing, an actuating member engageable with any selected one of said valves, the position of the actuating member being controlled by the vertical position of the multiple shuttle box, and activation of the actuating member controlled by the movement of the picker stick.

15. In a loom having a lay, a vertically shiftable multiple shuttle box at one end of the lay, individual compartments housing shuttles in the multiple shuttle box, pattern controlled means for shifting the multiple shuttle box, a first picker stick for driving the shuttles from the multiple shuttle box across the lay, a single shuttle box at the opposite end of the lay, a second picker stick for driving the shuttles from the single shuttle box across the lay; the combination of a first vacuum supply system to the compartments of the multiple shuttle box and a second vacuum supply system to the single shuttle box, the first vacuum supply system having pattern controlled means for cutting the vacuum supply from any one of the compartments of the multiple shuttle box upon movement of the first picker stick, and the second vacuum supply system having means controlled by movement of the second picker stick for cutting the vacuum supply to the single shuttle box.

16. A vacuum weft holder for attachment to a loom having a lay, a plurality of shuttle boxes comprising, means for creating vacuum air currents adjacent the mouth of each of said shuttle boxes having vacuum supply means to each of said shuttle boxes, first selective control means for selecting selected ones of said shuttle boxes to be supplied with vacuum air currents and a second control means for stopping the flow of vacuum to said vacuum supply lines, said second control means being controlled by and in timed relation with the flight of said shuttle.

17. In a vacuum weft holder for a loom having a lay, shuttle boxes at each end of the lay, shuttles and bobbins in said shuttle boxes for supplying a weft yarn with each flight of the shuttle across the lay during the formation of cloth by said loom; the combination of vacuum supply means adjacent the mouth of said shuttle boxes for engaging and holding the yarn left by the shuttle as the shuttle passes into the respective shuttle boxes, and control means for stopping the vacuum supply upon the shuttle leaving the shuttle box.

18. In a multiple shuttle loom provided with a lay, a pattern controlled vertically movable multiple shuttle box at one end of the lay, a single shuttle box at the opposite end of said lay, separate compartments in said vertically movable multiple shuttle box, and picker sticks for moving said shuttles from one end of said lay to the other; the combination of a vacuum weft holder comprising vacuum nozzles adjacent the mouth of each compartment of said multiple shuttle box, and the single shuttle box, screens in each vacuum nozzle, a multiple valve housing for controlling vacuum to the vacuum nozzles in the multiple shuttle box, a single valve housing for controlling vacuum to the vacuum nozzle in the single shuttle box, a plurality of individually operable valves in the multiple housing, a single valve in the single housing, linkage from one picker stick to the single valve, linkage from the other picker stick to the multiple valve housing and means controlled by movement of the multiple shuttle box for selecting one of the valves in the multiple valve housing to be closed upon the shuttle leaving the multiple shuttle box.

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