June 10, 1952 J. L. REYNOLDS, SR 2,600,128

PERFORATED PATTERN MECHANISM FOR LOOMS

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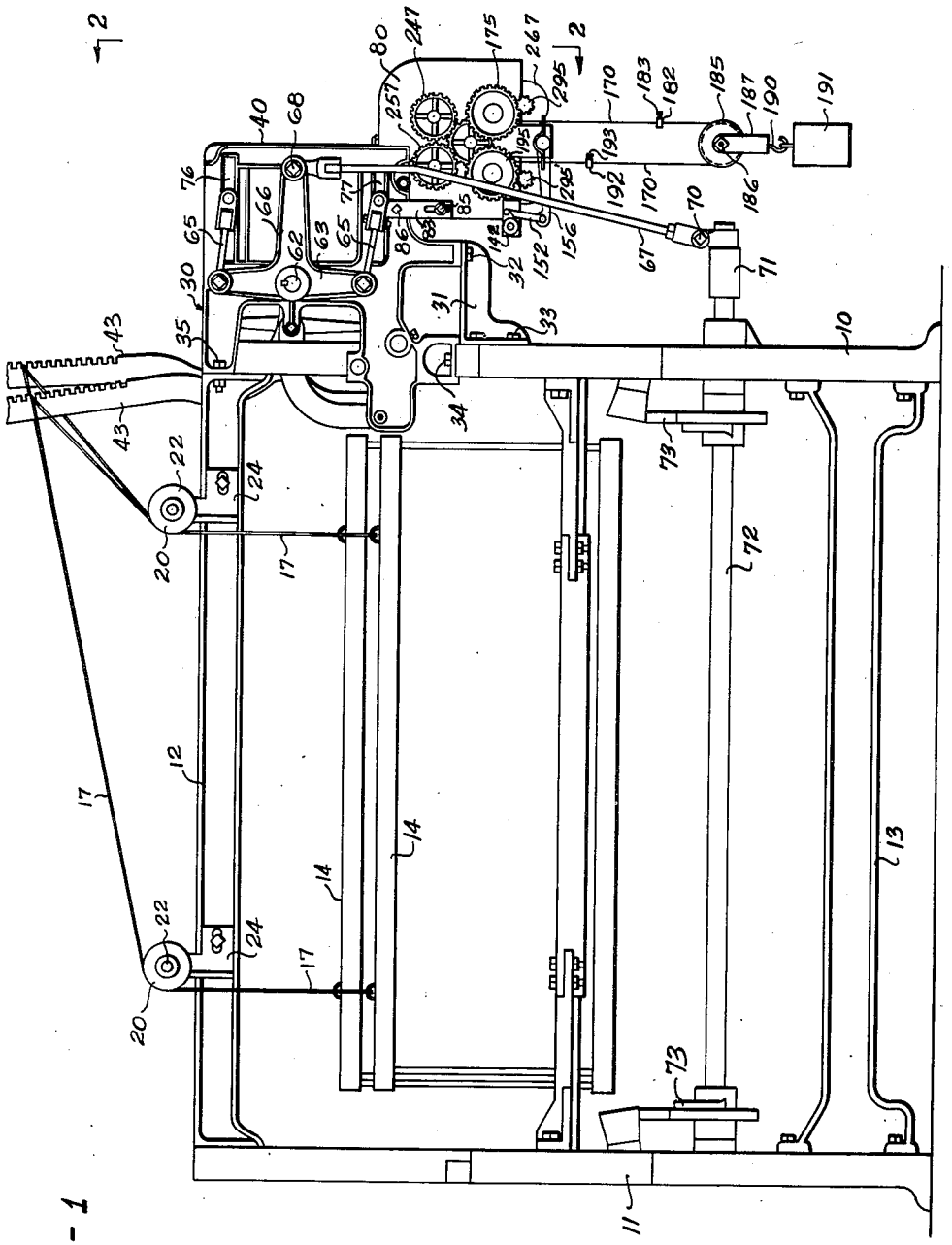


Fig-1

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By Paul Eaton

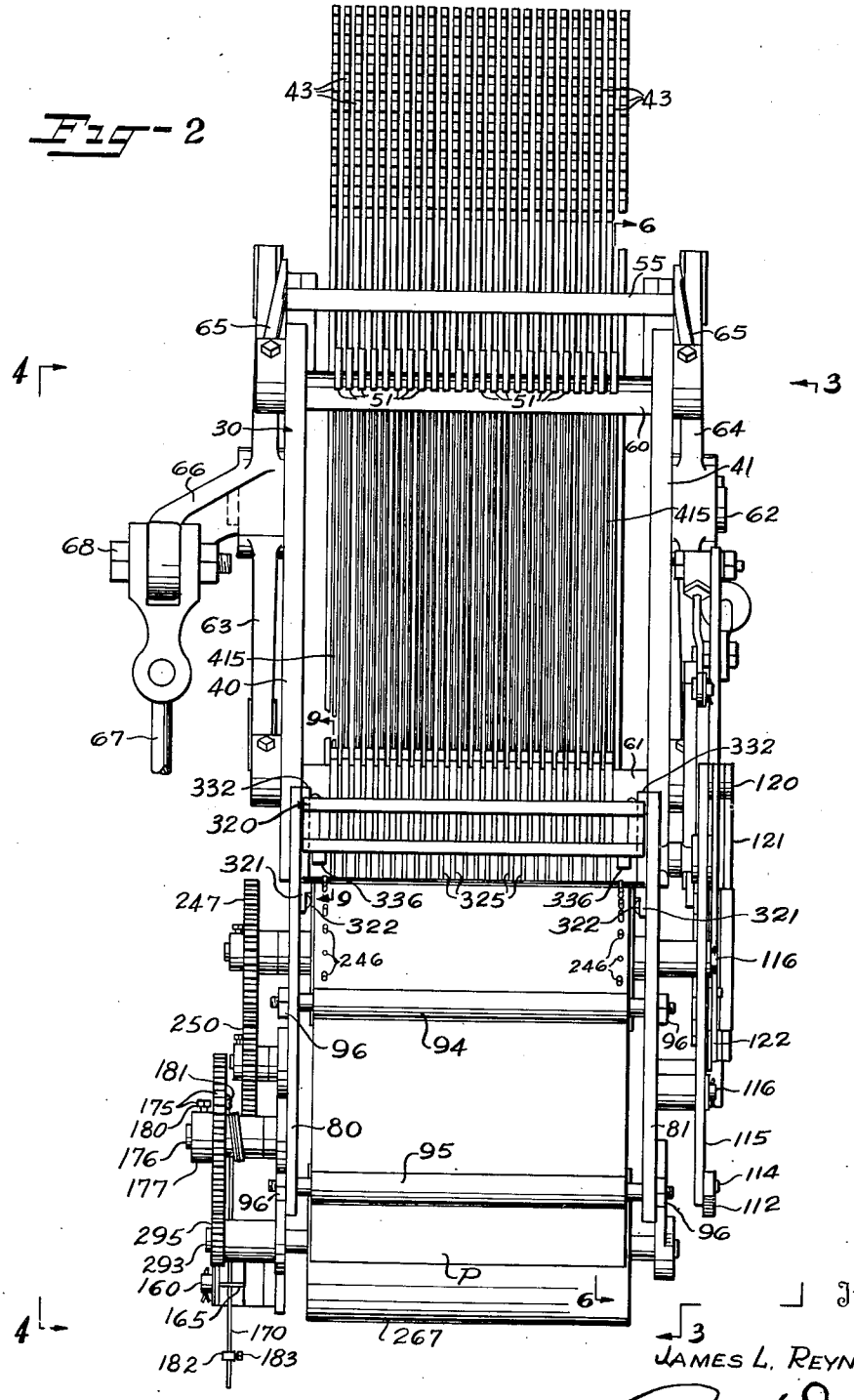
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PERFORATED PATTERN MECHANISM FOR LOOMS

Filed Aug. 5, 1948 9 Sheets-Sheet 2

Fig- 2



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PERFORATED PATTERN MECHANISM FOR LOOMS

Filed Aug. 5, 1948 9 Sheets-Sheet 3

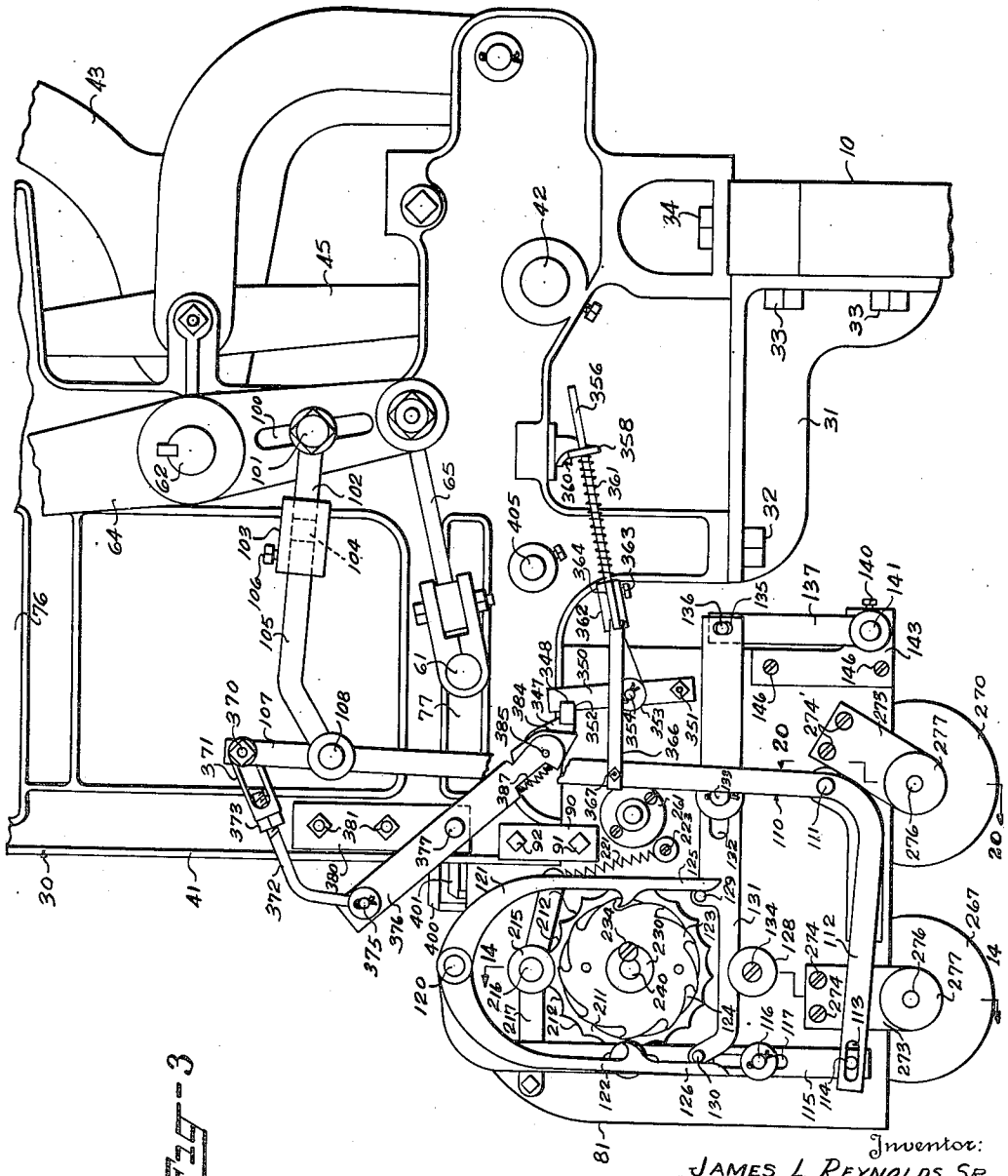


Fig-3

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PERFORATED PATTERN MECHANISM FOR LOOMS

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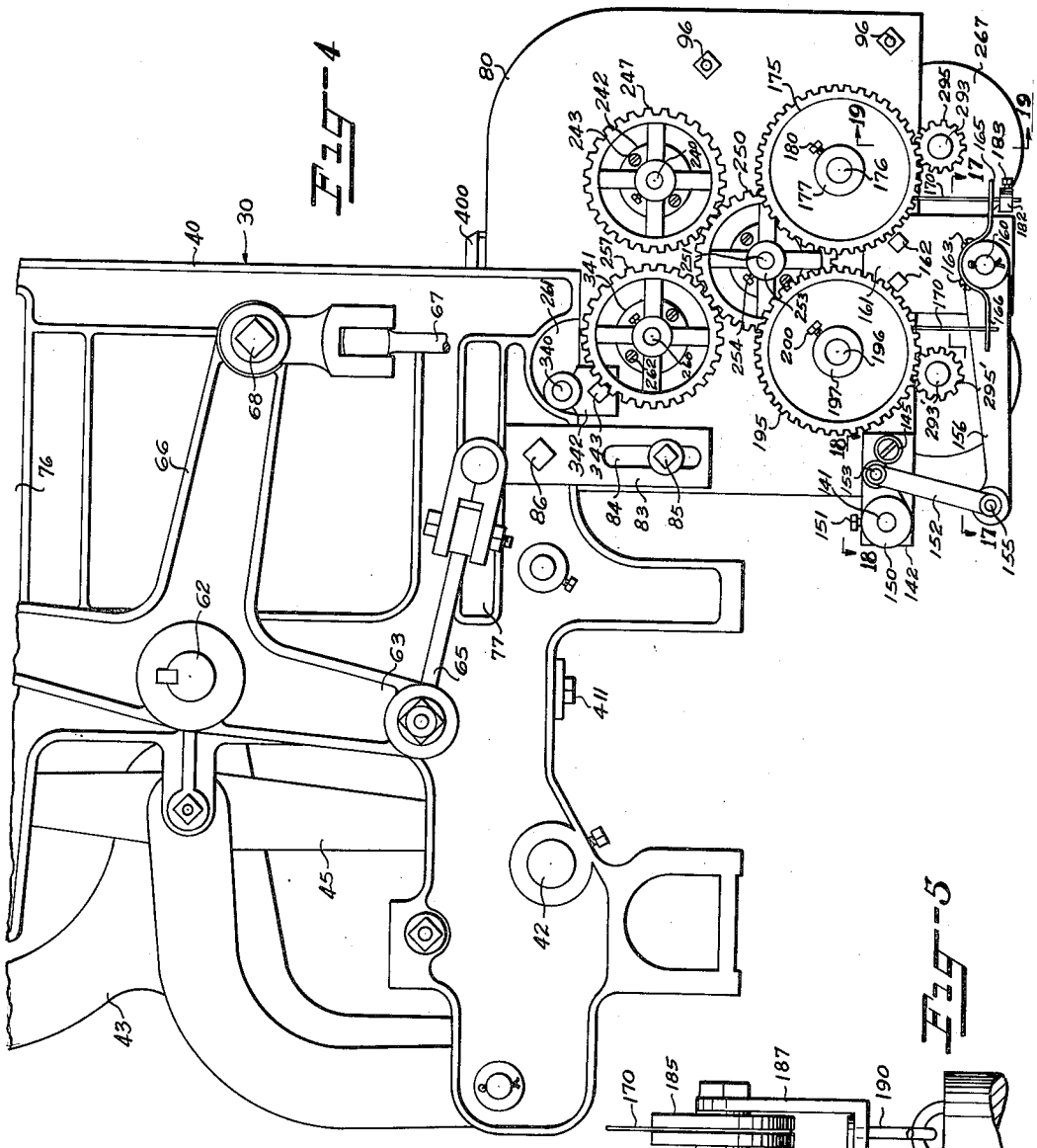


Fig-4

Fig-5

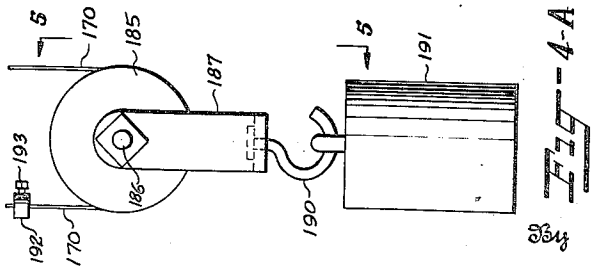


Fig-4-A

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PERFORATED PATTERN MECHANISM FOR LOOMS

Filed Aug. 5, 1948 9 Sheets-Sheet 5

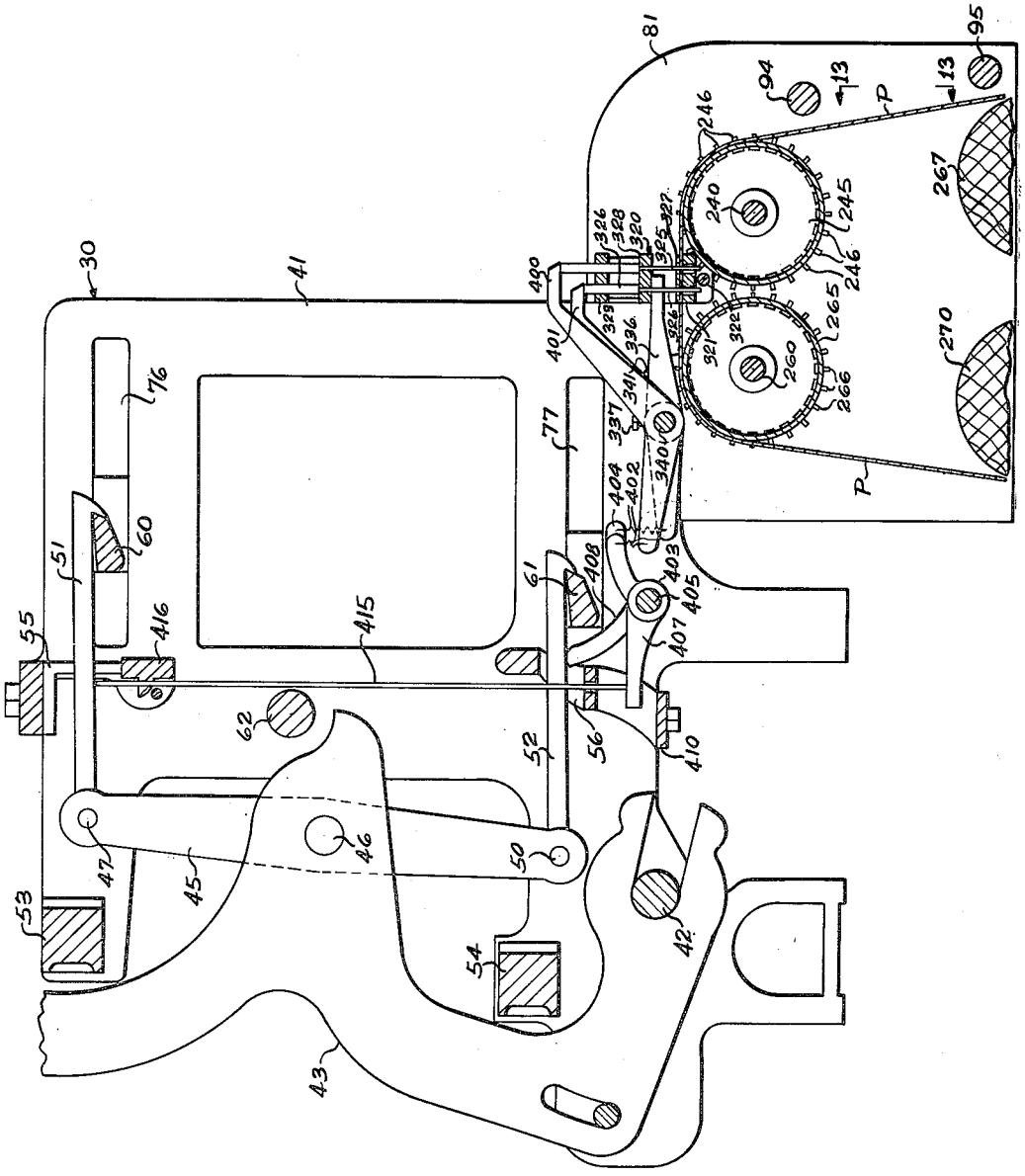


FIG-6

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PERFORATED PATTERN MECHANISM FOR LOOMS

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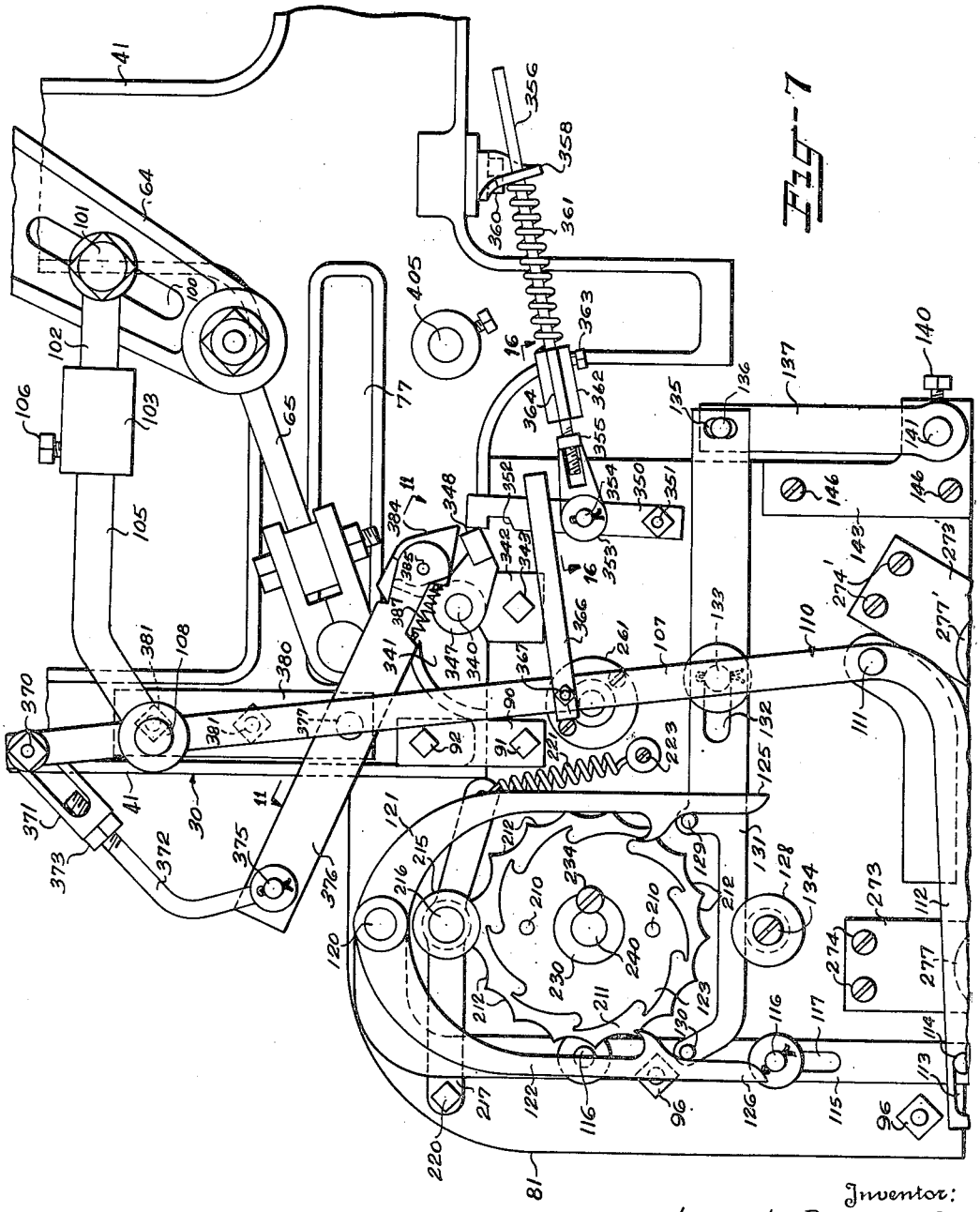


Fig. 7

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PERFORATED PATTERN MECHANISM FOR LOOMS

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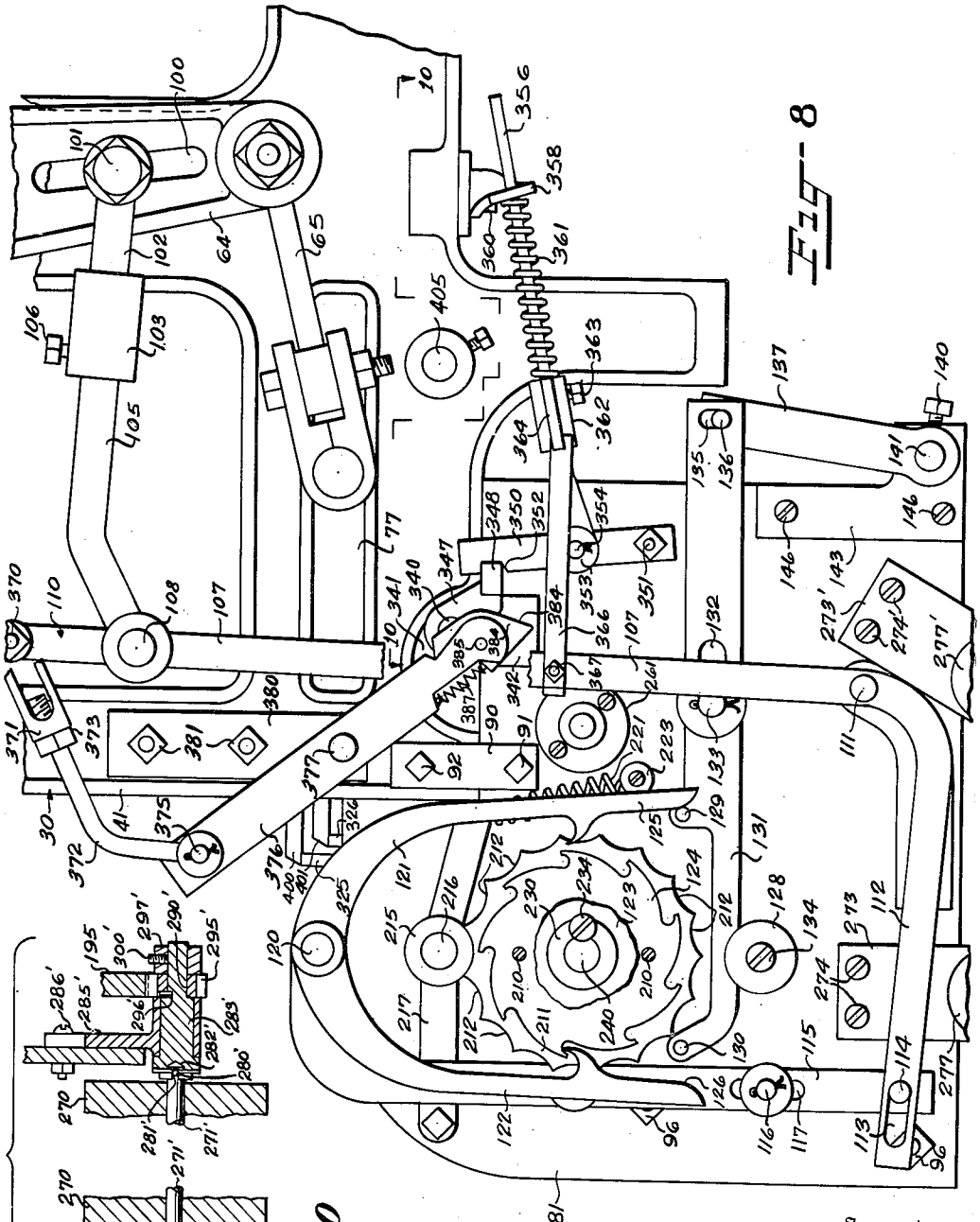


FIG-8

FIG-20

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June 10, 1952 J. L. REYNOLDS, SR 2,600,128

PERFORATED PATTERN MECHANISM FOR LOOMS

Filed Aug. 5, 1948 9 Sheets-Sheet 8

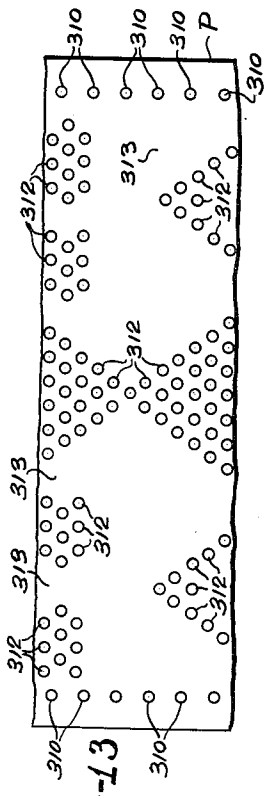


Fig-13

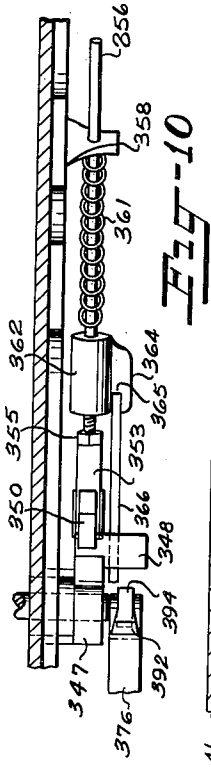


Fig-10

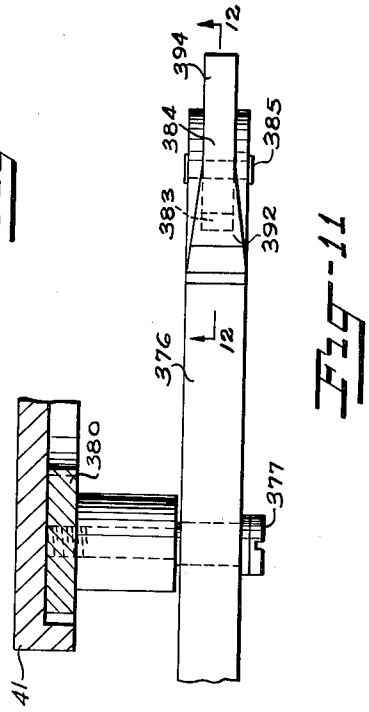


Fig-11

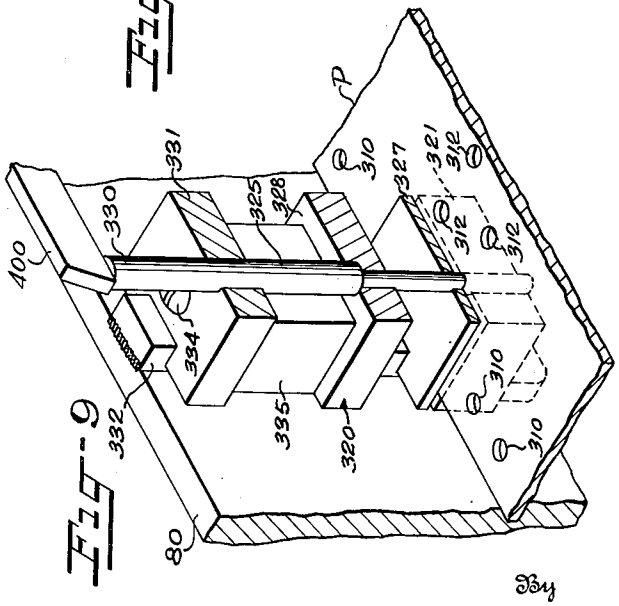


Fig-9

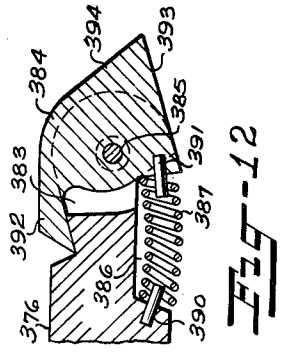


Fig-12

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PERFORATED PATTERN MECHANISM FOR LOOMS

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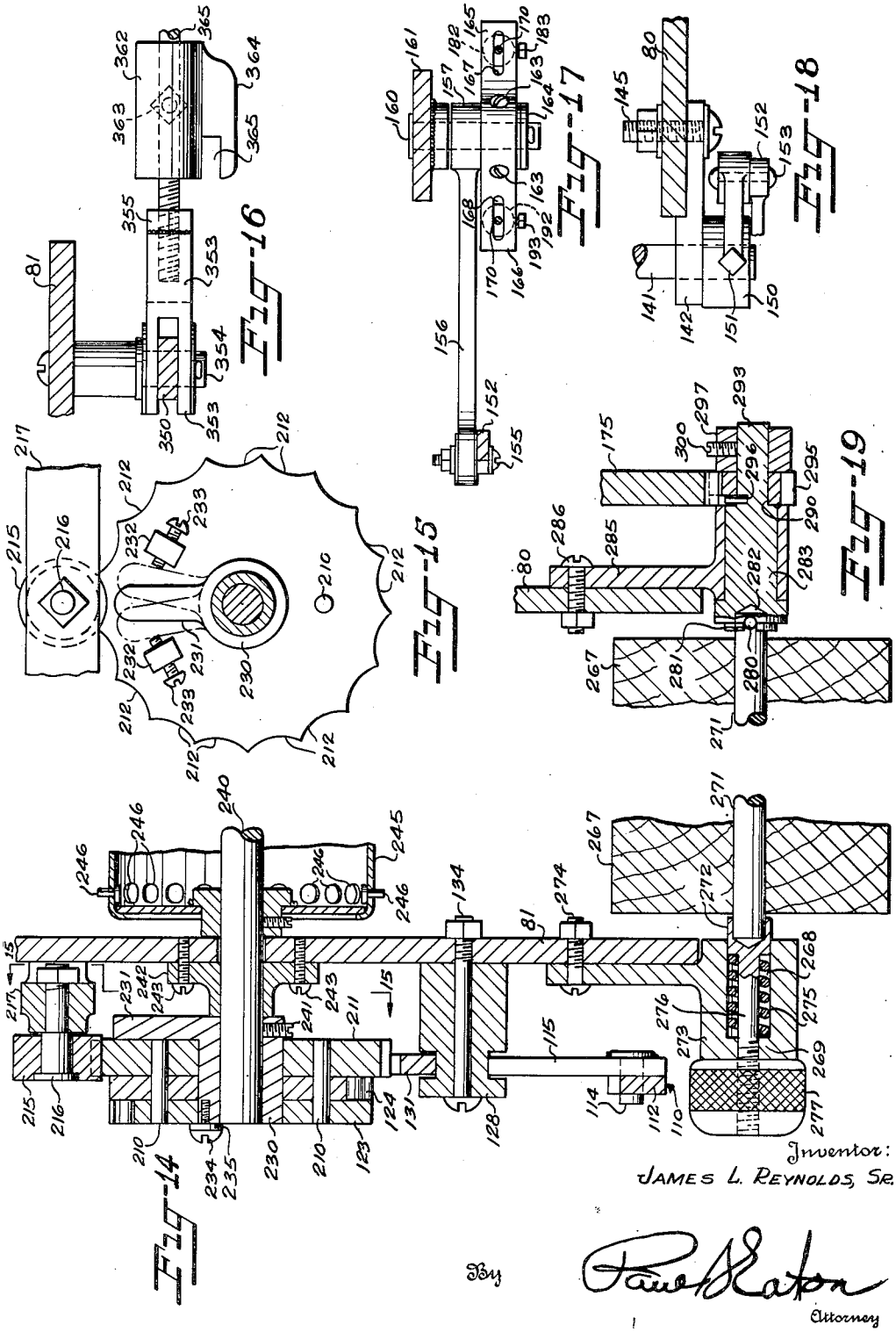


Fig-16

Fig-17

Fig-18

Fig-15

Fig-19

Fig-14

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Patented June 10, 1952

2,600,128

UNITED STATES PATENT OFFICE

2,600,128

PERFORATED PATTERN MECHANISM FOR LOOMS

James L. Reynolds, Sr., Charlotte, N. C., assignor to Sam Schwartz Machinery Corporation, Charlotte, N. C.

Application August 5, 1948, Serial No. 42,642

4 Claims. (Cl. 139—68)

1

This invention relates to a dobby loom and more especially to an improved pattern mounting means and improved means associated therewith for controlling the mechanism of a conventional dobby head.

It is well known to those familiar with the art that certain looms are equipped with a conventional dobby head having a plurality of jacks and index fingers or hooks, which are controlled by various means, one of said means being endless paper patterns punched to control one mechanism which in turn controls a second mechanism to selectively operate the hooks and the jacks for controlling the harness mechanism of the loom.

In the case where it has been necessary to repeat a particular pattern many times over, thereby requiring that the paper pattern be of considerable length, the length of the pattern member has been to such an extent that it has been necessary to provide boxes or other suitable containers disposed below and adjacent the dobby head of the loom, and in which the paper pattern has been stored as it was fed through the pattern controlling mechanism of the dobby head.

It is therefore an object of this invention to provide a pair of rolls to which opposite ends of a paper or fabric pattern member are secured and between which the mechanism to be actuated by the pattern member is disposed and the pattern member is rolled around the first of these rolls and as it is used, it is wound about the second of these rolls until a predetermined length of the pattern has passed through the pattern actuating mechanism for the dobby head. The pattern rolls are automatically reversed in such a manner that the pattern may be repeated and this continues for as long as the loom is running and thus decreases the required length of the pattern member considerably.

It is another object of this invention to provide a pattern sheet having a plurality of spaced rows of transverse perforations therein, said perforations being made according to a desired pattern, and to provide means for feeding the perforated pattern sheet through a mechanism for operating certain selected jacks in the dobby mechanism for controlling the harness mechanism of the loom, and whereby the pattern sheet is fed through this pattern actuating means in step by step relation so that every other one of the rows of perforations is moved into alignment with the mechanism for operating the certain jacks of the dobby head and whereby, when the pattern sheet has been completely used up from its feeding source, the mechanism will then reverse automatically, first moving one-half step and then resuming its full step by step movement in a direction opposite to that in which it had been previously moving, to scan the rows of perforations missed in the first scanning operation, thus requiring that the pattern sheet need not be as long as it would ordinarily have to be if a reversing mechanism of the type described were not used.

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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 schematic front elevation of a loom showing the dobby head mounted thereon and the invention associated therewith;

Figure 2 is an enlarged end elevation of the dobby head and being taken along the line 2—2 in Figure 1;

Figure 3 is an enlarged elevation looking from the right-hand side of Figure 2 to the left and is taken along the line 3—3 in Figure 2;

Figure 4 is an enlarged elevation looking from the left-hand side of Figure 2 to the right and is taken along the line 4—4 in Figure 2;

Figure 4–A is an extension of the lower right-hand portion of Figure 4;

Figure 5 is an elevation looking from the right-hand side of Figure 4–A to the left;

Figure 6 is an enlarged vertical sectional view taken along the line 6—6 of Figure 2;

Figure 7 is an enlarged elevation of the lower central portion of Figure 3 and showing the parts in a different relative position;

Figure 8 is an elevation similar to Figure 7 but showing the parts in another position and with some parts being broken away;

Figure 9 is an enlarged isometric view with parts in section and being taken along the line 9—9 in Figure 2;

Figure 10 is a sectional plan view taken substantially along the line 10—10 in Figure 8;

Figure 11 is an enlarged plan view with parts in section and being taken substantially along the line 11—11 in Figure 7;

Figure 12 is an enlarged vertical sectional view taken along the line 12—12 in Figure 11;

Figure 13 is an enlarged elevation of a portion of the perforated pattern member and is taken substantially along the line 13—13 in Figure 6;

Figure 14 is an enlarged vertical sectional view taken substantially along the line 14—14 in Figure 3;

Figure 15 is an elevation with parts in section and being taken substantially along the line 15—15 in Figure 14;

Figure 16 is an enlarged plan view with parts in section and being taken substantially along the line 16—16 in Figure 7;

Figure 17 is an enlarged plan view with parts

in section and being taken substantially along the line 17—17 in Figure 4;

Figure 18 is an enlarged plan view with parts in section and is taken substantially along the line 18—18 in Figure 4;

Figure 19 is an enlarged sectional plan view taken substantially along the line 19—19 in Figure 4;

Figure 20 is a view similar to Figure 19 and is taken along the line 20—20 in Figure 3.

Referring more specifically to the drawings, the numerals 10 and 11 indicate the right and left-hand side frame members of a loom which are connected at their upper ends by a conventional arch connection 12 and are connected at their lower ends by a girt 13. The loom has conventional harnesses 14 mounted therein, the lower ends of which are connected to conventional means, not shown, associated with the loom, and the upper ends of which have the lower ends of conventional harness straps 17 connected to the same which extend upwardly and pass over conventional sheaves 20 rotatably mounted on shafts 22 secured in suitable brackets 24 secured to the arch connection 12 of the loom, in a conventional manner.

A conventional dobby head, broadly designated at 30, is shown in the drawings as being mounted on the right-hand vertical side frame member 10 of the loom. However, it is obvious that this mechanism could be mounted on either side of the loom. This conventional dobby head 30 is mounted on the loom in a conventional manner and is shown in the drawings as being secured to an angle plate 31, as by screws 32, which, in turn, are secured to the frame member 10, as by screws 33.

The conventional dobby mechnism 30 is also secured to the side frame member 10, as by screws 34, and to one end of the arch connection 12, as by a bolt 35. The dobby head 30 comprises front and rear frame members 40 and 41, respectively, which support a rod 42 on which are mounted conventional harness lifter jacks 43 to which the upper ends of the harness straps 17 are connected as shown in Figure 1.

Each harness lifter jack has a conventional jack lever 45 (Figure 6) pivotally connected to the same, as at 46, and these jack levers 45 are pivoted as at 47 and 50 to upper and lower dobby hooks 51 and 52, respectively.

Top and bottom cross girts 53 and 54, respectively, serve to limit left-hand motion of the jack levers 45, in Figure 6, thus positioning the harness jacks 43. Top and bottom combs 55 and 56 serve to guide and support their respective hooks 51 and 52 in laterally spaced relation to each other. When any of the hooks 51 and 52 are in their lowered position, they are adapted to be engaged by upper and lower jack knives 60 and 61, and the front and rear frame members 40 and 41 each have upper and lower horizontally disposed slots 76 and 77, respectively, in which the opposite ends of the upper and lower knives 60 and 61, respectively, are mounted for reciprocatory movement. The mode of transmitting this reciprocatory movement is to be presently described.

A conventional rocker shaft 62 is oscillatably mounted in the front and rear dobby frame members 40 and 41, respectively, and extending outwardly beyond the same and has rocker arms 63 and 64 fixedly mounted at the front and rear ends thereof, respectively.

The upper and lower ends of the rocker arms 63 and 64 have conventional connecting rods 65 pivotally connected to the same, the other ends of which are pivotally connected to the ends of the jack knives 60 and 61 for imparting reciprocatory motion to the knives 60 and 61. The rocker arm 63 in Figures 1 and 4 has an outwardly extending portion 66 integral therewith which has pivotally connected thereto, as at 68, the upper end of a conventional dobby connecting rod 67. Referring to Figure 1, it may be observed that the dobby connecting rod 67 is pivotally connected at its lower end, as at 70, to a conventional dobby crank 71 secured on one end of a conventional pick shaft 72 rotatably mounted in the vertical side frame members 10 and 11 of the loom and having conventional pick cam wheels 73 mounted thereon.

The dobby head is associated with the harness mechanism of the loom as shown in Figure 1 for controlling the weave of a pattern being woven by the loom. The above described mechanism, which is a conventional part of a dobby loom, has heretofore been operated by various means including control chains and paper or fabric pattern members, and it is the object of this invention to provide a new and improved means for mounting the paper or fabric pattern member as well as an improved means for positioning the hooks 51 and 52 to thereby actuate the desired harness jacks 43 depending upon the nature of the pattern.

Referring to Figures 2, 3, and 4, there may be observed front and rear vertically disposed plates 80 and 81, respectively, on which the major part of the improved apparatus is mounted. The plate 80 is secured to the front dobby frame member 40 by a bar 83 having an adjustment slot 84 therein which is penetrated by a screw 85 threadably imbedded in the front vertical plate 80 and the plate 80 is cut to conform to the lower right-hand portion of the front dobby member 40, in Figure 4. The bar 83 extends upwardly and is secured, as by a screw 86, to the front vertical frame member 40 of the dobby head 30.

Referring to Figures 3, 7 and 8, it may be observed that the rear vertical plate 81 is cut to conform to the rear dobby frame member 41 and is secured to the same by a plate 90 which is slidably penetrated by screws 91 and 92, the screw 91 being imbedded in the plate 81 and the screw 92 being threadably imbedded in the dobby frame member 41.

Disposed between the vertically disposed plates 80 and 81 adjacent their outer edges (Figures 2 and 6) are spacer rods 94 and 95, the restricted opposite ends of which penetrate the vertically disposed plates 80 and 81, and have nuts 96 threadably mounted on the opposite ends thereof to thus secure the plates 80 and 81 to the opposite ends of the rods 94 and 95 and to thus lend rigidity to the plates 80 and 81.

The rearmost rocker 64 has a vertical slot 100 therein in which a pivot member 101 is mounted for vertical adjustment. This pivot member 101 has the right-hand end of a connecting rod 102 pivotally mounted thereon, in Figures 3, 7 and 8, and has an enlarged portion 103 at the other end thereof having a cavity therein in which the right-hand end of a connecting rod 105 is secured, as by a set screw 106, to thus permit longitudinal adjustment of the combined length of the connecting rods 102 and 105. The left-hand end of the connecting rod 105, in Figures 3, 7 and 8, is pivotally connected as at 108 to the vertical

leg 107 of an L-shaped member broadly designated at 110.

The L-shaped member 110 is oscillatably mounted on the vertically disposed plate 81 as at 111, adjacent its lower end, in Figure 3, and has a horizontal leg 112 integral therewith which has a horizontally disposed slot 113 therein.

The slot 113 is slidably penetrated by a pin 114 projecting rearwardly from an inverted L-shaped member 115. The L-shaped member 115 is also a vertically movable member and has spaced vertical slots 117 therein which are slidably penetrated by spaced pins 116 projecting from the vertically disposed plate 81 and being secured therein as by a pressed fit. The horizontal leg of the inverted L-shaped member 115 has pivotally mounted thereon, as at 120, depending pawl arms 121 and 122. The pawl arm 121 is adapted to engage intermittently a ratchet wheel 123 and the pawl arm 122 is adapted to intermittently engage a ratchet wheel 124.

These depending pawl arms 121 and 122 do not engage their respective ratchet wheels 123 and 124 simultaneously, inasmuch as the pawl arm 121 is adapted to intermittently rotate the ratchet wheel 123 in a counterclockwise direction in Figures 3, 7 and 8 and the pawl arm 122 is adapted to rotate the ratchet wheel 124 in a clockwise direction in Figures 3, 7 and 8. The pawl arms 121 and 122 have downwardly extending fingers 125 and 126, respectively, the proximate surfaces of which are adapted to be engaged by pins 129 and 130, respectively. The pins 129 and 130 are mounted, as by a pressed fit, in a horizontally disposed arm 131 having a slot 132 therein which is slidably penetrated by a pin 133 mounted as by a pressed fit in the vertically disposed plate 81 on which the arm 131 has horizontal sliding movement. The free end of the arm 131 has horizontal sliding movement also on a grooved block 128, secured as by a bolt 134 to the vertically disposed rear plate 81 (Figures 3, 7, 8 and 14).

The right-hand end of the arm 131 in Figures 3, 7 and 8 has a vertical slot 135 therein which is slidably penetrated by a pin 136 projecting from a substantially vertically disposed lever arm 137 secured, at its lower end, as by a set screw 140, on one end of a transverse shaft 141. The shaft 141 is oscillatably mounted in bearing blocks 142 and 143 secured to the front and rear vertically disposed plates 80 and 81, respectively. The bearing block 142 is secured, as by a bolt 145 (Figures 4 and 18), to the front vertically disposed plate 80 and the bearing block 143 is secured as by screws 146 (Figures 3, 7 and 8) to the rear vertical plate 81.

Referring to Figures 4 and 18, it may be observed that the front end of the oscillatable shaft 141 has an arm 150 securely mounted thereon, as by a set screw 151, and this arm 150 has the upper end of a link member 152 pivotally connected thereto, as at 153 and the lower end of the connecting link 152 is pivotally connected as at 155 to the left-hand end of an arm 156 in Figures 4 and 17.

The right-hand end of the arm 156 in Figures 4 and 17 has a boss 157 integral therewith which is oscillatably mounted on a pin 160 secured, as by a pressed fit, in the lower end of a vertically disposed plate 161, the upper end of which is secured, as by screws 162 (Figure 4) to the vertically disposed plate 80. The boss 157 of the arm 156 has secured thereon, as by screws 163, a strap iron member 164 having ears 165 and 166 integral therewith. It is obvious that the ears 165 and 166 of the strap iron member 164 may be cast integral with the boss 157, if so desired. The ears 165 and 166 have slots 167 and 168 therein, respectively, which are loosely penetrated by the right-hand and left-hand reaches, respectively, of a cable 170.

The upper end of the right-hand reach of the cable 170 is wound about the hub of a pinion 175 rotatably mounted on a stub shaft 176 secured as by welding to the vertical plate 80 (Figure 2). The pinion 175 is prevented from having endwise movement on the shaft 176 by a collar 177 securely mounted thereon, as by a set screw 180. The cable 170 is wound about the hub of the pinion and its free end is welded, as at 181 (Figure 2) to the vertical face of the pinion 175.

The right-hand reach of the cable 170 then extends downwardly from the pinion 175, through the slot 167 in the ear 165 of the member 164, as heretofore described, and has a collar 182 secured thereon, as by a set screw 183. The cable 170 then extends downwardly and passes beneath a suitable pulley 185 which is rotatably mounted on a bolt 186 mounted in the upper end of a U-shaped member 187 (Figures 4–A and 5). The U-shaped member 187 is slidably penetrated by a hook member 190, on which a suitable weight 191 is mounted. The cable 170 then extends upwardly and has a collar 192 mounted thereon, which is identical to the collar 182 mounted on the right-hand reach thereof and this collar 192 is secured on the left-hand reach of the cable 170, as by a set screw 193 (Figure 4–A).

The cable 170 in Figures 4 and 17 then extends upwardly through the slot 168 in the ear 166 of the member 164, as heretofore described, and its upper end is wound about the hub of a pinion 195 which is identical to the pinion 175 and to which the other free end of the cable 170 is secured in an identical manner. The pinion 195 is rotatably mounted on a stub shaft 196, which is identical to the stub shaft 176, and is also welded to the vertically disposed plate 80. This pinion 195 is also prevented from endwise movement on the shaft 196 by a collar 197 secured thereon, as by a set screw 200.

The ratchet wheels 123 and 124 (Figures 3, 7, 8 and 14) are held integral with each other by suitable dowel pins 210 (Figure 14) which also extend into a disk 211 having arcuate notches 212 in the periphery thereof. Attention is called to the fact that there are twice as many notches 212 in the periphery of the disk 211 as there are teeth in each of the ratchet wheels 123 and 124 and it is thus seen that with each upward stroke of the pawl arms 121 and 122, the ratchet wheels 123 and 124 will cause the associated disk 211 to rotate in one direction or the other, a distance equal to the center to center distance between two of the notches 212 in the periphery of the disk 211.

The notches 212 in the disk 211 are adapted to engaged by a roller 215 rotatably mounted on a shoulder bolt 216 (Figures 3, 7, 8 and 15) which has its other end fixedly mounted in a lever arm 217 pivotally secured, as at 220, to the vertically disposed plate 81. The lever arm 217 extends to the right beyond the roller 215 in Figures 3, 7 and 8, and has the upper end of a tension spring 221 connected to the same, the lower end of which is connected to a suitable spring perch 223 secured to the vertically disposed plate 81, to thus urge the roller 215 into engagement with the notches 212 in the periphery of the disk 211. The

purpose of the roller 215 engaging the notches 212 in the disk 211 is to assist in accurately positioning the cylinder and the associated pattern member, to be later described, and to also prevent unintentional rotation of the parts with which the disk 211 is associated.

It may be observed in Figure 14 that the ratchet wheels 123 and 124 and the disk 211 are rotatably mounted on a sleeve 230 having an arm 231 integral therewith (Figures 14 and 15). The disk 211 has spaced projections or ears 232 integral therewith which are threadably penetrated by adjustment screws 233, the proximate ends of which are adapted to alternately engage the arm 231 integral with the sleeve 230. The purpose of this arm 231 will be later described. The outer end of the sleeve 230 has a screw 234 threadably imbedded therein, on which a washer 235 is mounted, and this washer 235 slidably engages the outer surface of the ratchet wheel 123 to thus confine the ratchet wheels 123 and 124 and the disk 211 on the sleeve 230 against the arm 231, however, it is obvious that the disk 211 may have sliding movement against the arm 231.

The sleeve 230 is fixedly mounted on the rear end of a shaft 240, as by a set screw 241 (Figure 14). The shaft 240 is rotatably mounted in bearing blocks 242 secured as by screws 243, to the front and rear vertical plates 80 and 81. The shaft 240 has a cylinder 245 fixedly mounted thereon, having a plurality of equally and radially disposed spaced pins 246 projecting therefrom and being disposed adjacent opposite edges of the same.

It may be observed in Figure 4 that the front end of the shaft 240 has a pinion 247 fixedly mounted thereon which engages a pinion 250. The pinion 250 is rotatably mounted on a shouldered stub shaft 251 secured by screws 252 to the vertically disposed front plate 80, and this pinion 250 is prevented from having endwise movement on the shaft 251 by a suitable collar 253 fixedly mounted thereon, as by a set screw 254. This pinion 250 also engages a pinion 257 which is identical to the pinion 247 and is fixedly mounted on one end of a shaft 260 rotatably mounted in bearing blocks 261, secured as by screws 262, to the vertically disposed plates 80 and 81.

Fixedly mounted on the shaft 260 between the vertically disposed plates 80 and 81 is a second cylinder 265 having a plurality of pins 266 projecting outwardly therefrom and being equally spaced around the periphery and adjacent each end of the same. Disposed below the cylinders 245 and 265 is a feed roll 267 and a take-up roll 270, respectively. These rolls 267 and 270 are, in this instance, shown to be of wood material and are fixedly mounted on shafts 271 and 271' (Figures 19 and 20) however it is understood that wood material is not mandatory for these rolls.

The shafts 271 and 271' are mounted in identically the same manner and, consequently, only the shaft 271 on which the roll 267 is mounted will be described, and like parts associated with the roll 270 will bear like reference characters, with the prime notation added.

It may be observed in Figures 14 and 19 that the left-hand end of the shaft 271 is rotatably mounted in a plunger 272. A bearing block 273 having a bore 268 is secured, as by bolts 274, to the vertically disposed plate 81, and the plunger 272 is mounted for horizontal sliding movement in the bore 268.

The bore 268 in the bearing block 273 has a compression spring 275 mounted therein which engages and surrounds a restricted portion 276 of the plunger 272, and engages the main portion of the plunger 272. The bore 268 is restricted, as at 269, and the other end of the spring 275 engages the shoulder formed by the restricted portion 269 of the bore 268 to thus urge the plunger 272 from left to right in Figure 14 and to urge the plunger into engagement with the left-hand end of the shaft 271. The restricted portion of the plunger 272 has a knurled nut 277 threadably mounted on the outer end thereof which may be grasped by an operator and pulled from right to left in Figure 14 to thus release the left-hand end of the shaft 271 for removing the feed roll 267 for ease in mounting thereon the pattern member, to be later described.

The other end of the shaft 271, on which the feed roll 267 is fixedly mounted is fixedly penetrated by a transverse pin 280 projecting from opposite sides thereof. An extension shaft 283 is provided having a cavity 282 therein and being slotted, as at 281, in one end thereof. The pin 280 is adapted to fit in the slot 281 as the right-hand end of the shaft 271 is inserted in the cavity 282 in the extension shaft 283.

The extension shaft 283 is rotatably mounted in a bearing block 285 secured, as by bolts 286, to the vertical plate 80. This extension shaft 283 has a restricted portion 290 integral therewith on which a pinion 295 (Figures 4 and 19) is mounted and is keyed thereto by a pin 296. The pinion 295 is prevented from having endwise movement on the restricted portion 293 of the extension shaft 283 by a collar 297 secured thereon as by a set screw 300 (Figure 19).

The pinion 295 is adapted to engage the pinion 175 in Figure 4. Referring to Figures 4 and 20, there may be observed the pinion 295' which is identical to the pinion 295 and this pinion 295' is fixedly mounted on the restricted portion 293' of the extension shaft 283' which is identical to the shaft 283 heretofore described, and this pinion 295' meshes with the pinion 195.

The feed roll 267 has one end of a suitable paper or fabric pattern member indicated at P secured thereto, as by an adhesive or by staples or the like, and the required length of the pattern member P is wound about the feed roll 267 and then extends upwardly in Figure 6 over the cylinders 245 and 265, successively, and this pattern member P has a plurality of spaced perforations 310 adjacent opposite edges thereof which coincide with and are adapted to be engaged by the pins 246 and 266 in the cylinders 245 and 265, respectively.

The pattern member P then extends downwardly from the cylinder 265 and a minor portion of the pattern member P is wound about the roll 270 and its other end is secured to the roll 270, by any suitable means such as an adhesive or staples or the like.

Attention is called to the fact that although the roll 267 is referred to as a feed roll and the roll 270 is referred to as a take-up roll, it is obvious that when the pattern member P has been wound from the roll 267 to the roll 270, and the reversing mechanism has caused the pattern member P to change its direction, in the manner to be later described, the take-up roll 270 would then serve as a feed roll and the present feed roll 267 would serve as a take-up roll.

Referring to Figure 13, it may be observed that the perforations 310 adjacent opposite sides of the pattern member P are in alignment with

each other transversely of the pattern member P and there are pairs of transverse parallel rows of perforations 312 in alignment with each of the perforations 310 on a transverse plane relative to the pattern member P. It will be noted that there are imperforate areas 313 between the perforations 312 according to the desired pattern to be woven in the fabric.

The pattern reading unit broadly designated at 320 is shown in Figures 2, 3, 6 and 9. This pattern reading unit 320 comprises a lower transverse bar 321 secured, as by screws 322, to the proximate surfaces of the vertically disposed plates 80 and 81 and having a double row of bores 323 therein. The double row of bores 323 in the lower bar 321 coincide with each of the double rows of perforations in the pattern member P as the pattern member P is moved in step by step relation through the pattern reading unit 320, and the upper surface of the bar 321 supports the pattern member P as it is moved through the pattern reading unit 320 between the cylinders 245 and 265 (Figure 6).

Whenever perforations 312 in the pattern member P are in alignment with corresponding bores 323 in the bar 321, corresponding reading pins are adapted to penetrate the corresponding perforations 312 in the pattern member P and to loosely penetrate the corresponding bore 323 in the bar 321. There are two rows of these pattern reading pins, the pins in one row being indicated at 325 and the pins in the other row being indicated at 326.

The pins 325 and 326 are mounted for vertical sliding movement in the transverse guide bars 327 and 328 (Figure 9) and these pins 325 and 326 have enlarged portions 330 which slidably penetrate another transverse guide bar 331. The transverse bars 327, 328 and 331 are in parallel spaced relation to each other and are mounted for vertical sliding movement at each end thereof on guide members 332 secured, as by welding, to the proximate surfaces of the vertically disposed plate members 80 and 81 (Figures 2 and 6).

It may be observed in Figures 6 and 9 that the plate 327, being of a relatively light material is adapted to rest on the upper surface of the pattern member P as it passes over the transverse bar 321, to thus serve as a guide member for the pins 325 and 326 and due to the close promixity of the pattern member P to the plate 327, the plate 327 insures that the pins 325 and 326 will always be properly positioned for entering the perforations 312 in the pattern member P. When an imperforate area 313 passes beneath the pins 325 and 326, it is obvious that the pins 325 and 326 would merely ride on the upper surface of the pattern member P.

The uppermost transverse bar 331 is slidably penetrated adjacent each end thereof by a screw 334 and is threadably imbedded in the transverse bar 328 (Figure 9). It is thus seen that the transverse bars 328 and 331 will rise and lower, in a manner to be later described, simultaneously, and as the transverse bars 328 and 331 are raised, and inasmuch as the enlarged portion 330 of the pins 325 and 326 form shoulders which rest on the bar 328, the pins 325 and 326 would also be raised whenever the bars 328 and 331 are raised, by means to be presently described.

The free ends of a pair of arms 336 are adapted to engage the lower surface of the transverse bar 328, adjacent opposite ends thereof (Figures 2 and 6) and these arms 336 extend inwardly towards the harness raising jacks 43 and are fixedly mounted, as by set screws 337, on a transverse shaft 340. The front and rear dobby frame members 40 and 41 have openings 341 adjacent their lower edges and the transverse shaft 340 extends into these openings 341 and is oscillatably mounted in bearing blocks 342 secured, as by screws 343, to the vertically disposed plates 80 and 81 (Figures 4 and 7).

The rearmost end of this shaft 340, that is the end observed in Figures 7 and 8, has a dog 347 fixedly mounted having an ear 348 integral therewith. There is mounted adjacent this dog 347 a substantially vertically disposed lever arm 350 pivotally secured as at 351, to the vertically disposed plate 81. The lever arm 350 has a notch 352 therein which is adapted to be intermittently engaged by the ear 348 of the dog 347. When the ear 348 is in engagement with the lever arm 350, the plates 328 and 331, of the pattern reading unit 320, are in a raised position, not shown, so that the lower ends of the pins 325 and 326 are also moved upwardly out of engagement with the pattern member P to thus permit a step in the movement of the pattern member P between the bars 321 and 327. After a step has been made in the movement of the pattern member P, between the plates 321 and 327, the notched lever arm 350 is caused to move in a clockwise direction in Figures 3 and 8, out of engagement with the dog 347, to the position shown in Figure 7, by means to be presently described.

A forked member 353 is pivotally connected, as at 354 intermediate the ends of the lever arm 350 (Figures 3, 7, 8, 10 and 16). The forked member 353 has a nut 355 welded thereto which is adapted to be threadably penetrated by one end of a rod 356 which extends from left to right in Figure 7 and slidably penetrates a bracket 358 secured, as by a screw 360, to the rear vertical frame member 41 of the dobby head 30.

A compression spring 361 surrounds the rod 356 and engages the bracket 358 at one end thereof and the other end of the compression spring 361 engages an adjustable sleeve 362 secured on the shaft 356, as by a set screw 363. The sleeve 362 has a rib 364 integral therewith having a notch 365 (Figures 10 and 16) therein which is adapted to be intermittently engaged by the right-hand end of an arm 366 in Figure 7, fixedly secured as at 367 to an intermediate portion of the leg 107 of the L-shaped member 110.

It is thus seen that as the lower end of the rocker 64 moves from left to right in Figures 3, 7 and 8, the free end of the arm 366 will be moved from the position shown in Figure 7 into engagement with the notch 365 in the sleeve 362, as shown in Figures 3, 8 and 10, and would then continue to move from left to right in Figures 3, 7 and 8 to thus move the sleeve and the rod 356 associated therewith from left to right in Figures 3, 7 and 8, and this will cause the lever arm 350 to be moved in a clockwise direction in Figures 3, 7 and 8 to thus release the ear 348 of the dog 347 from engagement with the notch 352 in the upper end of the lever arm 350.

This allows the transverse bars 328 and 331 of the pattern reading unit 320 (Figure 6) to move downwardly, by gravity, and to, in turn, move the arms 336 in a clockwise direction in Figure 6, at which time the parts would rest in the position shown in Figures 6 and 7 with the exception that the reading fingers 325 and 326 may or may not be in the lowered position shown in Figure 6 depending upon whether or not there is one of the perforations 312 in alignment with each of the reading pins 326 and 325.

Pivotally connected to the upper end of the vertical leg 107 of the L-shaped member 110, as at 370, is a block 371 (Figures 3, 7 and 8) in one end of which one end of a connecting rod 372 is threadably imbedded and has a lock nut 373 thereon to thus lock the end of the connecting rod 372 in the block 371. The other end of the connecting rod 372 is pivotally connected, as at 375, to the upper end of an oscillatable lever arm 376 oscillatably mounted on a pin 377 projecting from a bracket 380 secured, as by screws 381, to the rear vertical frame member 41 of the dobby head 30.

The free end of the oscillatable lever arm 376 has a cavity 383 therein in which a dog 384 is pivotally mounted, as at 385 (Figures 3, 7, 8, 11 and 12). Referring to Figure 12, it may be observed that the free end of the oscillatable lever arm 376 also has a notch 386 therein, in which a compression spring 387 is disposed, the opposite ends of which are mounted on pins 390 and 391 secured as by a pressed fit in the oscillatable lever arm 376 and the dog 384, respectively. The pivoted dog 384 has an ear 392 integral therewith which is adapted to engage the free end of the arm 376 adjacent the cavity 383 as the pivoted dog 384 is urged in a counterclockwise direction in Figure 12 by the compression spring 387. The pivoted dog 384 also has a lower cam surface 393 and a diverging cam surface 394 and these surfaces 393 and 394 are adapted to intermittently engage the ear 348 of the dog 347, in a manner to be later described.

The enlarged portions 330 of the pattern reading fingers 325 are substantially longer than the portions 330 of the pattern reading fingers 326 in Figure 6. The pattern reading pins 325 and 326 control the position of the dobby hooks 51 and 52, respectively, through the medium of corresponding interconnected elements which will now be described. The upper ends of the enlarged portions 330 of the fingers 325 loosely touch the outer ends of alternately spaced oscillatable fingers 400 and the upper ends of the enlarged portions 330 of the fingers 326 loosely touch the upper ends of alternately spaced oscillatable fingers 401, which are disposed between the oscillatable fingers 400. The fingers 400 and 401 (Figure 6) are oscillatably mounted on the transverse shaft 340 intermediate their ends, and the opposite ends of the same have tension springs 402 connected to the same which extend upwardly and are connected to the ends of bell cranks 404 and 403, respectively. The bell cranks 403 and 404 are oscillatably mounted on a transverse shaft 405 secured at each end thereof to the front and rear vertical frame members 40 and 41, respectively, of the dobby head 30.

The bell cranks 403 and 404 have respective arms 407 and 408, the arm 408 being substantially longer than the arm 407 and being disposed at a somewhat different angle than the arm 407. The upper free ends of the arms 408 of the bell cranks 404 have sliding movement in the conventional comb member 56 which thereby serves as a guide member for the upper ends of the arms 408 and the arms 408 engage the lower surfaces of the conventional hooks 52.

Disposed below the conventional comb member 56 is a comb member 410, one end of which is secured to the rear vertical frame member 41 of the dobby head 30 by the same screw 360 that secures the bracket 358 to the same (Figure 7), the other end of the comb member being secured, as by a screw 411, to the lower surface of the front vertically disposed frame member 40 of the dobby head 30 (Figure 4).

The arms 407 of the bell cranks 403 extend into the comb 410 and have vertical sliding movement in the same and are guided by the same and the upper portion of this comb 410 is slidably penetrated by a plurality of vertically disposed rods 415, there being one of these vertically disposed rods 415 to accommodate each of the arms 407 of the bell cranks 403. These rods 415 extend upwardly and also have vertical sliding movement in a transverse bar 416 which is a part of the conventional comb 56 heretofore described.

These rods 415 extend upwardly beyond the bar 416 and the upper ends of the same engage the lower surfaces of the hooks 51 connected to the jack levers 45.

Method of operation

In the operation of this apparatus, a suitable pattern member P has one end thereof secured to the feed roll 267 and it is then wound about the same, leaving a substantial length of the pattern member P free so that it may be extended over the cylinders 245 and 265 and through the pattern reading unit 320 disposed therebetween and so the other end of the same may be extended downwardly and secured to the takeup roll 270. It has already been described how the pattern member P must be placed on the rollers 245 and 265 in such a manner that the pins 246 and 266 project through the perforations 310 adjacent opposite sides of the pattern member P. This is so the pattern will be caused to move when the cylinders 245 and 265 are caused to rotate.

During the time that the pattern member P is being mounted on the cylinders 245 and 265, in the manner heretofore described, the transverse bars 328 and 331 may be raised manually to thus move the lower ends of the pattern reading pins 325 and 326 upwardly out of the path of the pattern member P.

The loom is then started in a conventional manner and the pick shaft 72 transmits rotation to the dobby crank 67 thereby causing the rockers 64 and 63 to oscillate. With each revolution of the pick shaft 72 two picks will have been woven in the operation of the loom and it is thus seen that when the dobby connecting rod 67 is moved downwardly, the uppermost hook 51 will move from left to right in Figures 1, 4 and 6 to thus move the associated harness jacks 43 inwardly of dobby head 30 and to raise the harnesses 14 connected to the same by the harness straps 17, and as the dobby crank 71 passes through the upper part of its stroke, thus moving the dobby connecting rod 67 upwardly, the knife 60 will move from right to left in Figures 1 and 6 and the lower knife 61 will move from left to right to move any of the hooks 52, which may be in position to be engaged by the same, from left to right to thus actuate the corresponding harness jacks 43 and to thus raise the corresponding harnesses connected thereto by the straps 17. This is a typical operation of a double indexing dobby head.

Now, assuming that the parts are in the position shown in Figure 3, when the loom is started, the knife 61 will move towards the loom or from the position shown in Figure 3 to the right-hand end of the slot 77 in the frame member 41 of the dobby head 30 and the uppermost knife 60 moves outwardly or away from the loom, in the opposite direction. Now, as the knife 61 moves toward the loom, any of the hooks 52 which may

be in engagement with the same are temporarily released from the bottom knife 61 and those in engagement with the upper knife 60 are moved from left to right to thus move the harness jacks 43 inwardly and to thereby raise the corresponding harnesses 14.

Now, as these knives 60 and 61 alternately move toward the left hand end of the associated slots 76 and 77 in Figure 6, the hooks 51 and 52 are released and certain of these hooks may be raised upwardly out of engagement with the knives 60 and 61 by the pattern means in the manner to be presently described. It is obvious that any of these hooks 51 or 52 that are raised upwardly would not be engaged by the knives 60 or 61 as they move outwardly away from the left-hand ends of the slots 76 and 77, respectively, and the corresponding harnesses 14 would remain in their lowermost position.

Now, as the lower end of the rocker 64, in Figure 3, moves from left to right, the vertical leg 107 of the L-shaped member 110 also moves from left to right, at its upper end, to thus cause the lever arm 376 to partially rotate in a clockwise direction. Simultaneously the arm 366 engages the notch 365 in the sleeve 362 (Figures 3, 8 and 10) to thus move the substantially vertically disposed lever arm 350 out of engagement with the ear 348 of the dog 347 to thereby release the same and to permit the transverse bars 328 and 331 of the pattern reading unit 320 to move downwardly, by gravity, as heretofore described.

However, immediately before the ear 348 of the dog 347 is released, in the manner heretofore described, the pawl arm 122 will have moved upwardly beyond engagement with the corresponding ratchet wheel 124 and will have thus transmitted one step in the rotation of the cylinders 245 and 265 in a counterclockwise direction in Figure 6, and the pattern member P will thus remain stationary during the time the dog 347 is out of engagement with the notch 352 in the lever arm 350. Simultaneously, the pattern reading pins 325 and 326 perform their selective operation on the hooks 51 and 52 in accordance with the perforations 312 in the pattern member P in the manner to be later described.

When the dog 347 is released, the shaft 340, on which the dog 347 is mounted, will be caused to rotate slightly in a counterclockwise direction, in Figure 7, and the dog 347 will thus engage that portion of the lever arm 350 disposed above the notch 352 and the lever arm will be urged against the ear 348 of the dog 347 by the compression spring 361 around the rod 356 (Figure 7).

Now, as the knife 61 moves from right to left in Figures 3, 7 and 8, the L-shaped member 110 is caused to move about its pivot point 111 in a counterclockwise direction which will also move the lever arm 376 in a counterclockwise direction from the position shown in Figure 8 to that shown in Figure 7. Assuming that the ear 348 of the dog 347 is out of engagement with the notch 352 in the lever arm 350, the surface 394 of the pivoted dog 384 will engage the ear 348 of the dog 347 and this will cause the pivoted dog 384 to partially rotate in a clockwise direction in Figure 12 as the free end of the lever arm 376 passes by the dog 347. As soon as the surface 394 moves past the dog 347, while it is in the position stated, the dog 384 is then urged in a counterclockwise direction in Figure 12 by the compression spring 387 to the position shown in Figure 12.

Now, assuming that the rocker 64 has reached the end of its stroke as shown in Figure 7, the rocker 64 then moves from left to right at its lower end, and the vertical leg 107 of the L-shaped member 110 is moved from left to right at its upper end to thus move the lever arm 376 in a clockwise direction in Figure 7. Now, as this arm moves in a clockwise direction, the surface 393 of the pivoted dog 384 engages the top surface of the ear 348 of the dog 347 to move the same downwardly until it has passed beyond the limits of the ear 348 which is due to the different distances from the pivot points to the ends of the lever arm 376 and the ear 348 and to thereby release the dog 347 at which time it will again move upwardly slightly and the upper end of the lever arm 350 will have been urged from right to left in Figure 7 by the compression spring 361 and the ear 348 will again engage the notch 352 in the lever arm 350.

As this dog 347 is caused to move downwardly at its right-hand end, or in a clockwise direction in Figure 7, it is obvious that the pattern reading unit 320 will again be raised, in the manner heretofore described, by the arms 336 thus moving the pins 325 and 326 out of the path of the pattern member P.

The movement of the free end of the lever arm 376 being much faster than the movement of the horizontal leg 112 of the L-shaped member 110, the lever arm 376 will have raised the reading pins 325 and 326 just in time for the ratchet wheel 124 to be engaged by the pawl arm 122 to thus move the shaft 240 in a clockwise direction in Figure 7 the equivalent of the center to center distance between two of the arcuate notches 212 in the disk 211, or in other words, the disk 211 will come to rest as every other notch 212 in the disk 211 is engaged by the roller 215. This will cause the cylinder 245, in Figure 6, to rotate in a counterclockwise direction and to advance the pattern member P past the lower end of the reading pins 325 and 326 the equivalent of two double rows of perforations 312, thus passing by every other double row of perforations 312 so that these may be engaged, in a manner to be later described, upon the reverse movement of the pattern member P through the pattern reading unit 320.

Now, as the pins 325 (Figure 6) register with corresponding perforations 312 in the pattern member P the right-hand end of the fingers 400 move downwardly to thus permit the bell crank 403 to partially rotate in a counterclockwise direction and to thereby permit the vertically disposed rods associated therewith to move downwardly and to thus lower the free ends of the corresponding hooks 51 to where they may be engaged by the knife 60 upon its outward stroke.

The pattern reading pins 325, upon registering with the perforations 312 in the pattern member P, allow the free ends of the pattern reading fingers 401 associated therewith to move downwardly, thereby permitting the corresponding bell cranks 404 to partially rotate in a counterclockwise direction, in Figure 6, thereby lowering the free end of the associated hooks 52 to thereby be engaged by the knife 61 as it moves from left to right in Figure 6.

The purpose of the tension springs 402 in Figure 6 between the bell cranks 403 and 404 and the reading fingers 400 and 401, respectively, is to prevent breakage of the arms 407 and 408 or any other interconnected parts, when the dog 347 is moved downwardly in a clockwise direction in Figure 7 which, of course, raises the lower ends of the pins 325 and 326 upwardly out of engage-

ment with the pattern member P and thus causes the reading fingers 400 and 401 to partially rotate in a counterclockwise direction in Figure 6 and thus these tension springs 402 permit certain of the bell cranks 403 and 404 to remain stationary as the left-hand end of the pattern reading fingers 400 and 401 move downwardly in Figure 6.

Certain of the bell cranks 403 and 404 would be caused to remain stationary, under these circumstances, due to the fact that the associated hooks 51 or 52 may be in engagement with the knives 60 and 61, in their course of travel, and thus could not be raised by the bell cranks 403 and 404.

Attention is called to the fact that the eccentric weight of the pawl arm 122 causes the pawl arm 122 to engage the ratchet wheel 124, in Figure 8, and the pawl arm 121 is prevented from engaging the ratchet wheel 123 by the pin 129 on the arm 131. Now, as the pattern member P feeds from the roll 267 to the roll 270 in Figure 6, this causes the pinion 295 to rotate in a counterclockwise direction in Figure 4 to thus rotate the pinion 175 in a clockwise direction and this will cause the cable 170 to wind around the hub of the pinion 175. Simultaneously, the takeup roll 270 would be rotating in a counterclockwise direction in Figures 4 and 6 to thus cause the pinion 295' to rotate in a counterclockwise direction and permit rotation of the pinion 195 in a clockwise direction to thereby permit the cable 170 to be unwound from the same. The pulley 185 and its associated weight also induce rotation of the pinion 295' as the cable is unwound from the pinion 195 and is wound on the pinion 175. As this takes place, the collar 182 on the right-hand reach of the cable 170 moves upwardly and engages the ear 165 of the strap iron member 164 to thus cause the same to partially rotate in a counterclockwise direction in Figure 4. This would cause the arm 156 to move downwardly at its left-hand end in Figure 4 and would cause the shaft 141 to move in a clockwise direction in Figure 4 and in a counterclockwise direction in Figures 3, 7 and 8. Conversely, the collar 192 functions in the same manner as the collar 182 to again reverse the direction of movement of the pattern member P opposite to that which is to be presently described.

Now, as this shaft 141 partially rotates in a counterclockwise direction in Figures 3, 7 and 8, the arm 131 would move from right to left in Figure 7 or from the position shown in Figure 8 to the position shown in Figure 7 and the pin 130 would then engage the finger 126 of the pawl arm 122 to move the same to a position where it would not engage the ratchet wheel 124. However, this would also permit the pawl arm 125 to move, by gravity, into a position where it would engage the ratchet wheel 123 on its upward stroke, which would be transmitted to the same in the same manner as the upward stroke is transmitted to the pawl arm 122, as heretofore described.

It is thus seen that the pawl arm 121 would then engage the ratchet wheel 123 in such a manner as to cause the shaft 240 to rotate in a counterclockwise direction as observed in Figures 3, 7 and 8 and to thus transmit rotation to the cylinder 245 in a clockwise direction as observed in Figure 6, to thereby reverse the direction of movement of the pattern member P through the pattern reading unit 320.

It has been previously stated that this shaft 240 rotated in a counterlockwise direction in Figure 6 as the pattern member P was fed from the roll 267 to the roll 270, and during this time the portion 231 of the sleeve 230 in Figures 14 and 15 will have been in the right-hand dotted line position indicated in Figure 15.

However, when the shaft 240 is caused to reverse its direction as hereinbefore described, the ratchet wheels 123 and 124 and the disk 211 will partially rotate a distance equivalent to the distance from one of the arcuate notches 212 in the disk 211 to the center of the next succeeding arcuate notch 212, before causing the shaft 240 to turn and at which time the arm 231 of the sleeve 230 would move from the right-hand dotted line position to the left-hand dotted line position shown in Figure 15. Motion would then be transmitted to the shaft 240, in a counterclockwise direction in Figure 6, first a half step, then it would resume a full step with each upward stroke of the pawl 121, and it is thus seen that the double rows of perforations 312 that were not engaged by the lower end of the pattern reading fingers 325 and 326 as the pattern member P advanced from right to left in Figure 6, now are caused to register with the pattern reading fingers 325 and 326, upon reverse movement of the pattern member P, while the double rows of perforations 312 that registered with the pins 325 and 326 as it moved from right to left in Figure 6 are caused to pass through the pattern reading unit 320 without stopping to register with the pins 325 and 326.

This is necessary due to the fact that the pins 325 and 326 would not transmit the pattern to the harnesses correctly if the same holes were to be penetrated by the pins 325 and 326 upon its reverse movement through the pattern unit 320.

It is thus seen that I have provided an improved means for mounting a perforated pattern member for cooperating with a conventional dobby head whereby the length of the pattern member P may be greatly decreased and whereby I have eliminated the necessity of providing containers or boxes or the like on the floor of a weave shop adjacent the dobby head of a loom for storing a major part of the pattern member P therein while the pattern member P is being fed through a pattern reading mechanism.

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 dobby loom having harness jacks and hooks and knives, said hooks being adapted to intermittently engage said knives for operating the harness jacks, a pattern member for controlling the position of said hooks relative to the knives, said pattern member having a plurality of transverse rows of perforations therein, a pair of cylinders over which said pattern member is adapted to pass, shouldered pattern reading pins adapted to engage said pattern member between said cylinders, means for advancing said pattern member past the pattern reading pins in step by step relation, means for intermittently raising and lowering said shouldered pattern reading pins comprising a transverse member in which said pattern reading pins are mounted for vertical sliding movement, an oscillatable shaft mounted in parallel relation to said transverse member, an arm extending from said oscillatable

shaft to beneath the transverse member, a dog secured to one end of said oscillatable shaft, a lever arm disposed adjacent one end of said dog, and having a notch therein which is adapted to be intermittently engaged by said dog for causing the free end of said arm engaging the lower surface of said transverse member to remain in a raised position to thereby hold the pattern reading pins out of engagement with the pattern member, means for moving said notched lever arm out of engagement with the dog to thereby permit the transverse member to move downwardly, by gravity, and to thus raise the free end of said dog and to lower the pins into engagement with the pattern member.

2. In a structure according to claim 1, the means for moving the notched lever arm comprising an oscillatable lever arm disposed adjacent said dog, said oscillatable arm having a pivoted dog at one end thereof, said pivoted dog having an ear integral therewith and spring means for urging said ear into engagement with the end of the oscillatable lever arm, said first-named dog being adapted to be engaged by the pivoted dog as the adjacent end of said oscillatable lever arm moves in one direction and the pivoted dog being prevented from pivoting by its ear engaging the oscillatable lever arm to thus move the free end of the first-named dog downwardly and into engagement with the notched lever arm thereby causing the arm connected to the oscillatable shaft to raise the transverse member in which the pattern pins are mounted and whereby upon movement of the adjacent end of said lever arm in the opposite direction, the pivoted dog will be moved into engagement with the free end of the first-named dog but will be permitted to pass by the same due to the spring means associated therewith.

3. In a dobby loom having harnesses and a dobby head thereon and said dobby head having an elongated perforated pattern member and jacks and means responsive to the perforations in the elongated pattern member moving past a predetermined point for moving said jacks to control the raising and lowering of the harnesses, means for mounting and driving said pattern member comprising a pair of spaced rotatable shafts disposed on the same horizontal plane, said shafts having cylinders fixedly mounted thereon, said pattern member being adapted to pass between the cylinders in one direction, means for driving one of the cylinders comprising a sleeve fixedly mounted on one end of the associated shaft of said cylinder, a pair of juxtaposed and interconnected ratchet wheels loosely mounted on said sleeve, a disk having spaced arcuate notches in its periphery and being disposed in juxtaposed relation to and also being connected to the ratchet wheels, said disk having a pair of spaced ears on the opposite side thereof from the ratchet wheels, said sleeve having an arm integral therewith and extending upwardly between the ears of said disk, a spring pressed roller adapted to engage the arcuate notches in the periphery of the disk, a pair of oscillatably mounted pawl arms disposed adjacent the ratchet wheels, means for transmitting oscillatory movement to the pawl arms, automatic means for holding one of said pawl arms out of engagement with one of the ratchet wheels while the other of the pawl arms is held in engagement with the other of the ratchet wheels, and automatic means for disengaging the second pawl arm from the second ratchet wheel and moving the first pawl arm into engagement with the first ratchet wheel simultaneously to transmit reverse rotation to the cylinder on which the pattern member is mounted, said ratchet wheels being adapted to advance the disk and the associated cylinder in one direction so the disk stops as every other arcuate notch is engaged by the spring pressed roller, and whereby when the other of the pawl arms is brought into engagement with the corresponding ratchet wheel, the disk will be caused to move in the opposite direction a distance equal to the center to center distance from one of the arcuate notches to the next before again transmitting step by step movement to the associated cylinder, the length of each step then being the same as they were upon the movement of the cylinder being in its original direction.

4. In a dobby loom having harness frames and a dobby frame and knives and dobby hooks for raising and lowering the harness frames and also having a driven rocker arm for imparting movement to the knives and also having an elongated pattern member provided with spaced transverse rows of perforations for controlling the raising and lowering of the harness frames and also having pattern reading pins for each row of perforations, means for withdrawing said reading pins from the path of the pattern and means for simultaneously advancing the pattern in step by step relation so the pattern is advanced the distance of two double transverse rows of the perforations so the pattern pins will engage every other double row of perforations as the pattern is advanced in one direction, means responsive to movement of certain perforations in said pattern member into register with certain of said pattern reading pins to cause certain of the dobby hooks to be in engagement with the dobby knives while the remaining dobby hooks will be held out of engagement with the dobby knives to thereby control the pattern woven by the loom by causing certain of the harness frames to be raised while other of the harness frames remain in a lowered position, said means for advancing the pattern member comprising at least one roll rotatably mounted in the dobby frame, a rotatable shaft on which the roll is fixed, at least one ratchet wheel fixed on said shaft, a vertically movable member adjacent said ratchet wheel, a pawl carried by the vertically movable member and adapted to engage the ratchet wheel, an L-shaped member oscillatably mounted on the dobby frame and connected to one end of the movable member at one end thereof, and a connecting rod connected at one end to the rocker arm and at its other end to the free end of the L-shaped member for oscillating the L-shaped member to, in turn, transmit vertical reciprocatory motion to the movable member for driving the ratchet wheel and the roll.

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