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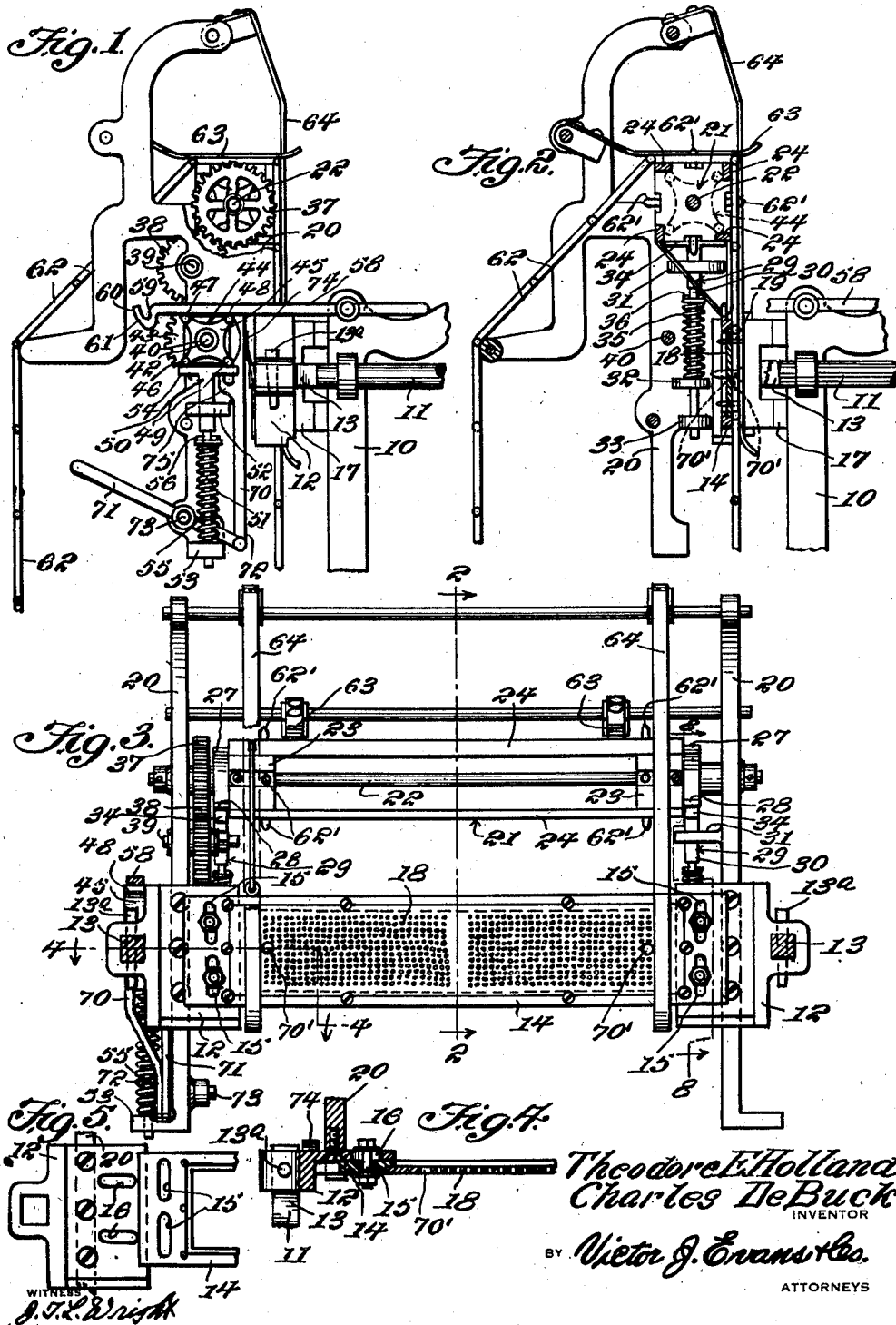
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JACQUARD MACHINE

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2 Sheets-Sheet 1



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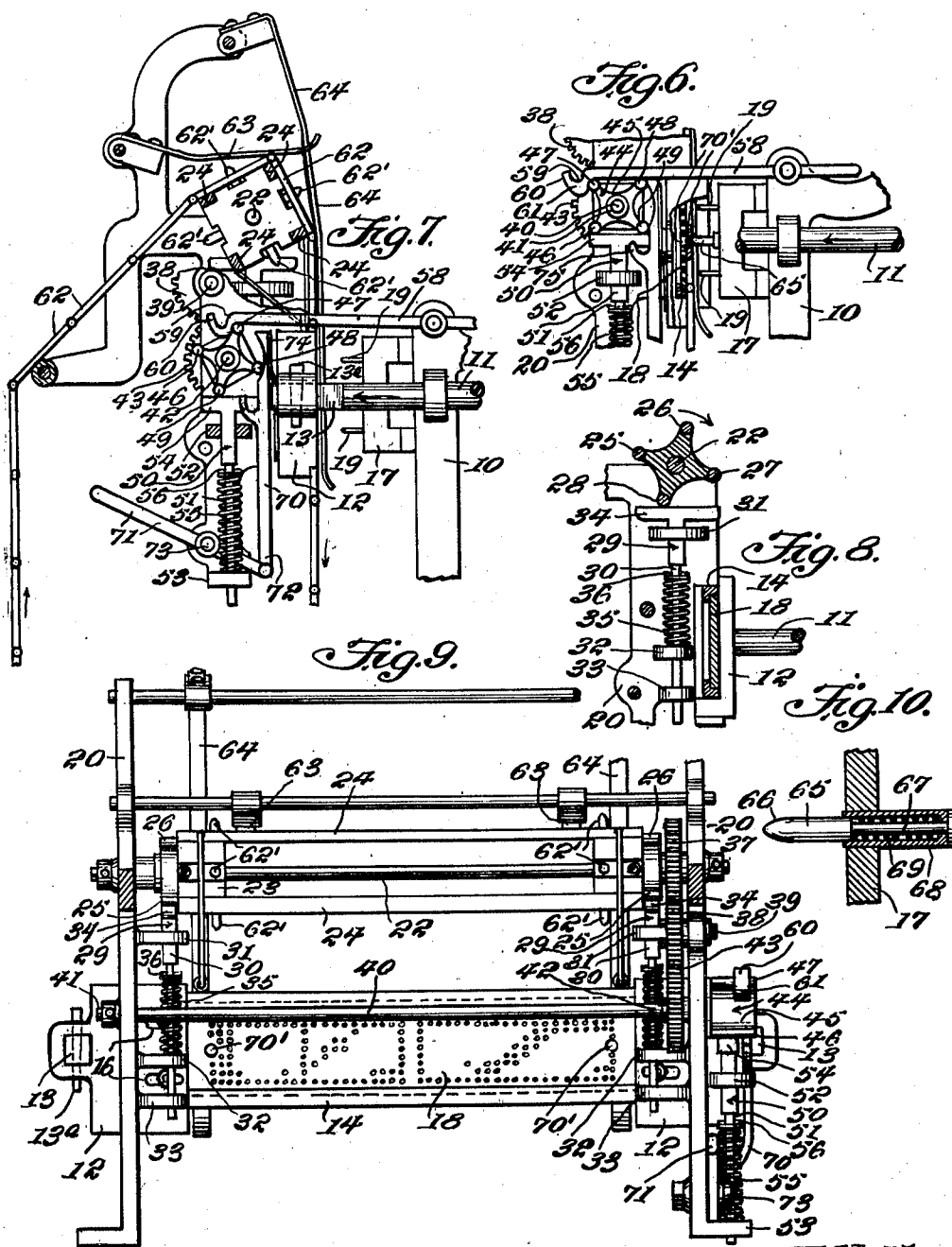
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Theodore E. Holland
Charles DeBuck INVENTOR
BY Victor J. Evans & Co.
ATTORNEYS

WITNESS
J. L. Wright

UNITED STATES PATENT OFFICE

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JACQUARD MACHINE

Theodore E. Holland and Charles De Buck,
Paterson, N. J.

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2 Claims. (Cl. 139—332)

Our invention relates to new and useful improvements in jacquard cylinder movements.

An important object of our invention is to provide a mechanism adapted to be associated with a Jacquard loom for progressively positioning the series of pattern cards in cooperative relation with the needle board, in a manner whereby each of the cards will be precisely presented in correctly aligned relation with the needle board to reduce wear on the cards and their lacings to a minimum.

Another object of our invention is to provide a mechanism of the above-mentioned character which includes a cylinder that operates in a unique manner whereby the card positioned in cooperative alignment with the needle board will be moved normally away therefrom until the card fully clears the needles, at which time the cylinder will be actuated to position the succeeding card in correct alignment with the board preparatory to the advancement of the same into cooperative relation with the board.

Still another object of our invention is the provision of a mechanism of the above-mentioned character wherein the cylinder is positioned above the needle board, thereby eliminating all possibility of contact between the cylinder and needle board and the consequential injury to the needles and other immediate parts associated therewith.

Yet another object of our invention is to provide a mechanism of the above-mentioned character that has a reversing means incorporated therewith, whereby, the cards may be progressively backed up or retrogressed.

Other objects and advantages of our invention will be apparent during the course of the following description.

In the drawings, forming a part of this specification, and wherein like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of a device embodying our invention, and showing the same cooperatively associated with the needle board of a Jacquard loom,

Figure 2 is a vertical sectional view taken on the line 2—2 of Figure 3,

Figure 3 is a rear elevation of our device,

Figure 4 is a fragmentary transverse sectional view taken on the line 4—4 of Figure 3,

Figure 5 is a fragmentary plan view illustrating the adjustable connection between the plate holder and plate embodying a part of our invention,

Figure 6 is a fragmentary side elevation illus-

trating the cylindrical rotating mechanism after the initial movement of our device in a direction away from the needle board of the loom,

Figure 7 is a view similar to Figure 2, but showing the cylinder rotating mechanism after the device has moved a maximum distance away from the needle board,

Figure 8 is a fragmentary vertical sectional view taken on the line 8—8 of Figure 3,

Figure 9 is a front elevation of our device, and Figure 10 is a fragmentary view illustrating one of the card positioning plungers incorporated in the needle board structure of the loom.

In the accompanying drawings, wherein for the purpose of illustration, is shown a preferred embodiment of our invention, the numeral 10 designates a Jacquard frame provided with horizontal slide rods 11 which may be rocked in any manner to impart a reciprocating horizontal movement thereto, the rods usually being given one complete reciprocatory movement for each beat of the loom. It is to be understood that only such parts of the Jacquard loom are shown as are necessary to set forth the present invention and to illustrate its association with the constituent parts thereof.

The present invention is primarily concerned with the position of the cylinder and with the mechanism for imparting rotation thereto. The numeral 12 designates plate supporting brackets mounted on the square terminal ends 13 of the slide rods 11, and retained in fixed association therewith by the locking pins 13a. The frame 14 extends between the brackets 12 in confronting relation to the needle box 17 of the Jacquard loom and the opposite ends thereof are provided with a pair of vertically spaced elongated slots 15 which register with the vertically aligned horizontally elongated slots 16 in the brackets in a manner to permit the same to be bolted, or otherwise secured together. The normally elongated slots 15 and 16 permit the frame 14 to be longitudinally and vertically adjusted relative to the needle box whereby the perforated plate 18 carried by the frame may be positioned in properly adjusted relation to the needles 19.

The spaced vertical supports 20 are secured to the outer faces of the brackets 12 and coextend a substantial distance above the plate in a manner to position the cylinder 21 extending therebetween in vertically spaced relation therewith. The cylinder includes a shaft 22 having its opposite ends journaled for rotation in horizontally aligning bearings in the supports and substantially square heads 23 fixed to the shaft and

spaced slightly inwardly from the said supports. The corners of the heads are connected by longerons 24 which define an elongated, essentially square cylinder positioned in such relation to the plate 18 that the outer faces of the inner pair of vertically aligning longerons 24 will lie in the same plane as the inner face of the plate.

The heads 23 are provided with outwardly extending lugs 25, 26, 27 and 28 at the corners thereof, which lugs are abuttingly engaged by the spring urged stop members 29. Each of the stop members comprises a stem 30 slidably mounted in vertically aligning openings in the vertically spaced arm portions 31, 32 and 33 of the supports 20, and a transverse head portion 34 normally held in engagement with the lower pair of lugs by the coil spring 35. The springs 35 seat against the arm portions 32 and the transverse pins 36 carried by the stems 30 in a manner to hold the heads 34 in yieldable engagement with the lugs. When arranged in the above manner the heads 34 will act to hold the outer faces of the inner vertically spaced longerons in the same plane as the inner face of the plate 18.

Means for imparting rotation to the cylinder is provided, which means includes a circular gear 37 fixedly secured at one end of the shaft 22 intermediate the support 20 and the lugs 25, 26, 27, and 28. The gear is adapted to mesh with the circular idler gear 38 journaled on the stub shaft 39 which projects from the support 20. The shaft 40 has its opposite ends 41 and 42 journaled in horizontally aligning openings in the supports 20 and the circular gear 43 is journaled thereon in meshed relation with the idler gear 38.

The end 42 of the shaft 40 extends outwardly of the support and carries the spider 44 thereon. The spider includes a center plate 45 formed with outwardly extending lugs 46, 47, 48 and 49 arranged in the form of a square and adapted to be yieldably engaged by the spring influenced stop member 50. The stop member 50 includes a stem 51 slidably mounted in vertically aligned openings in the outwardly extending bracket arms 52 and 53. The transverse head portion 54 of the shank is normally held in engagement with the lowermost pair of lugs of the spider 44 by the coil spring 55, the lower end of which seats against the bracket arm 53 and the upper end thereof seats against the transversely extending pin 56 carried by the stem. The stop member 50 normally holds the spider 44 against casual rotation and with the upper edge of the head 54 thereof engaging the lowermost pair of lugs to hold the same in horizontal alignment.

Rotation may be imparted to the gear 43 by the pawl 58 pivoted to the frame 19 of the jacquard. The free working end of the pawl is fashioned into a depending essentially V-shaped formation to define a hook 59 and an outwardly and upwardly extending terminal end 60 having a cam face 61. The pawl normally bears against the topmost pair of lugs of the spider 44 and with the hook 59 disposed a substantial distance therebeyond, as illustrated in Figure 1. Reciprocating movement of the rods 11 will first move the frames 20 and the adjuncts associated therewith in a direction away from the needle board 17. No motion will be imparted to the gear 43 until after the initial outward movement of the arms 11 and until the first of the upper pair of lugs of the spider engages the hook 59 of the pawl. After such engagement continued movement of the arms 11 will effect the rotation of the gear

through an arc of substantially 45°, as illustrated in Figure 7, whereby the outermost of the pair of spider lugs engaged by the head of the stop member 50 will be moved upwardly in a clockwise direction and the resilient action of the spring 51 against the other of the lowermost lugs will cause the gear to complete a turn of 90° to move the inner most of the upper pair of lugs into engagement with the head 54. Rearward movement of the arms 11 will cause the cam face 61 of the terminal end of the pawl to bear against the outermost of the upper pair of spider lugs and to ride over the same without effecting reverse rotation of the gear 43.

It may thus be seen that one complete reciprocatory movement of the arms 11 forwardly and rearwardly will cause the gear 43 to make a quarter of a revolution. The turning of the gear will not be effected until the plate 18 has moved normally from the needle board 17 a sufficient distance to clear the needles 19. As soon as the plate has cleared the needles, the spider 44 will be engaged by the pawl 58 in the manner hereinabove described to effect the rotation of the gear 43. The quarter turn imparted to the gear by each reciprocation of the arms 11 will be completed before the arms complete their rearward travel by virtue of the spring pressed engagement of the stop member 50 with the lugs of the spider. After the gear has completed the quarter turn, continued rearward movement of the arms 11 will cause the plate 18 to be advanced normally toward the needle board in properly aligned relation therewith. The gears 37, 38 and 43 have a one to one ratio, whereby rotation of the gear 43 to a quarter of a turn in a given direction will impart an equal rotation in the same direction to the gear 37 to effect the rotation of the cylinder 21.

The series of pivotally connected pattern cards 62 are associated with the cylinder in the well known manner, one of the cards being held in engagement with the uppermost pair of longerons by the dogs 62' and spring arms 63; the succeeding card being held in engagement with the outer faces of the innermost pair of vertically aligned longerons by another pair of dogs 62' and by the elongated spring arms 64. The arms 64 are of sufficient length to extend across the plate 18 in a manner to hold the series of pattern cards depending from the cylinder 21 in appressed relation with the inner face of the plate. The stop members 29 and 50 yieldably engaging with the lugs projecting from the opposite ends of the cylinder will assure the proper positioning of the same after each actuation thereof and will assure the proper alignment of each of the cards with the plate 18 as it moves downwardly from the cylinder. The spring arms 64 are sufficiently resilient in their nature to permit the card supported by the topmost pair of longerons to be moved to the inner vertical side of the cylinder without danger of tearing or otherwise injuring the same and, after such rotation of the cylinder, the arms will move into engagement with their respective cards to hold the same in appressed relation with the longerons.

By virtue of the manner in which the cylinder is positioned with its inner face in vertical alignment with the inner face of the plate 18, each of the cards will be progressively lowered into juxtaposition with the plate in a manner whereby no rotating parts will coact with the needle board 17. In the past considerable difficulty has been experienced by attempting to feed the cards one at

a time to the needle board by rotation of a cylinder disposed in cooperative relation therewith. The angular movement required to present each new card to the board resulted in the cards being subjected to severe strains. The cards were frequently torn and the consequential jamming of the machine resulted in an unnecessary loss of time and labor. In our operation, the plate is first moved normally away from the needle box, another card is lowered into juxtaposition with the plate while the same is removed from the needle box and the plate is thereafter advanced normally toward the needle box with all parts in properly positioned alignment.

In order to assure the proper alignment of the needle board 17, plate 18 and the intervening card 62, we have provided each end of the needle board with an adjusting plunger 65. The outer end of the plunger is rounded as at 66 and the rearward end thereof is provided with a shank 67 which operates within the sleeve 68 and against the resilient action of the coil spring 69. Each of the cards and the plate 18 is provided with registering openings 70', whereby movement of the plate toward the needle box will permit the rounded ends of the plungers 65 to first enter the openings 70' in the card and to thereafter enter the openings 70' in the plate to assure the proper alignment thereof with the needle board before the needles 19 are engaged.

The lower end 72 of the reversing lever 70 is pivoted to the actuating handle 71 and the handle is pivoted to the support 20, as at 73. The lever 70 extends upwardly from its pivot in outwardly spaced relation with the plate 18 to abuttingly contact the pawl 58. The spring arm 74 carried by the bracket 12 holds the lever against the innermost pair of vertically aligned lugs of the spider 44, and the resilient action of the spring arm will permit the lever to be moved in the direction of the bracket upon rotation of the spider in a manner not to interfere with the free rotation of the cylinder 21. The upwardly directed hook portion 75 of the lever 70 is normally disposed a sufficient distance below the lugs of the spider to permit the same to rotate without engagement therewith; however, upon downward movement of the operating handle 71 the hook 75 will be moved upwardly into engagement with one of the spider lugs to rotate the spider in a direction opposed to the direction of rotation imparted thereto by the pawl 58. As the lever moves upwardly to engage the lug of the spider, the abutting end thereof will elevate the pivoted pawl 58 out of engagement with the lugs of the spider to permit the lever to effect the rotation of the gear 43 a quarter of a revolution in an anti-clockwise direction. Upon ac-

tuation of the reversing mechanism, the arms 11 may make a complete reciprocation without engagement of the pawl with the spider and the pattern cards 62 will have been regressively moved by the operation of the lever 70.

It may thus be seen that we have provided a cylindrical movement for a Jacquard loom wherein the series of pattern cards will be progressively lowered into juxtaposition with a plate which is arranged to travel normally toward and away from the needle board of the machine. The movement includes means to automatically seriatly move the cards into operative relation with the needle board, and means to automatically render the first mentioned means inoperative and to regressively move the cards relative to the needle board when desired. Each of the movements is effected evenly and smoothly in a manner whereby tearing of the cards and the consequential jamming or injury of the needles is efficaciously prevented.

It is to be understood that the form of our invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of our invention, or scope of the appended claims.

Having thus described our invention, we claim:

1. In a Jacquard machine, a frame, a vertical-disposed backing plate mounted on the frame, a rotary rectangular cylinder mounted on the frame above the backing plate operative to present cards at the front face of the backing plate, the said backing plate and cylinder being disposed so that cards at the front of the cylinder and the backing plate respectively will assume approximately coplanar arrangement, and a pair of spring arms mounted on the frame and extending transversely of the cylinder and backing plate for yieldingly pressing cards against the front of the cylinder and the backing plate.

2. In a Jacquard machine, a frame, a backing plate mounted on the frame, a cylinder operative to present cards at the front face of the backing plate rotatably supported on the frame, the said backing plate and cylinder being disposed so that cards at the front of the cylinder and the backing plate respectively will assume approximately coplanar movement, and an elongated spring member having one end fixed to the frame extending transversely of the cylinder and the backing plate so as to simultaneously resiliently press cards against the front of the cylinder and the backing plate.

THEODORE E. HOLLAND.
CHARLES DE BUCK.