Aug. 19, 1930. C. A. FISHER 1,773,305

JACQUARD LOOM CYLINDER

Filed Feb. 15, 1929

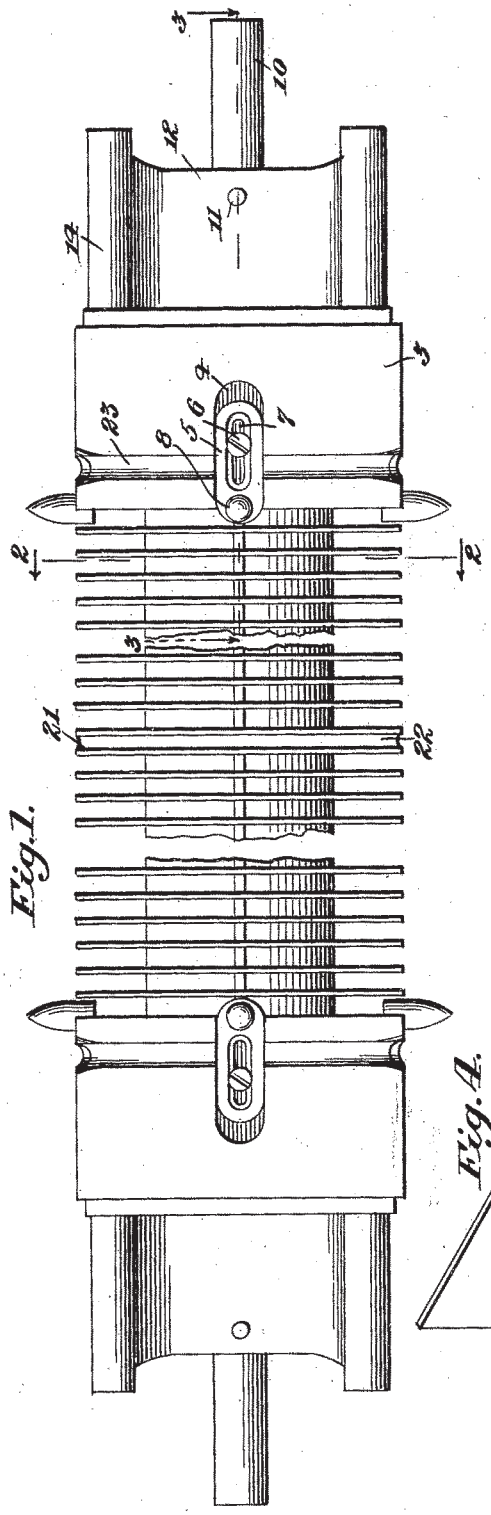

Fig. 1.

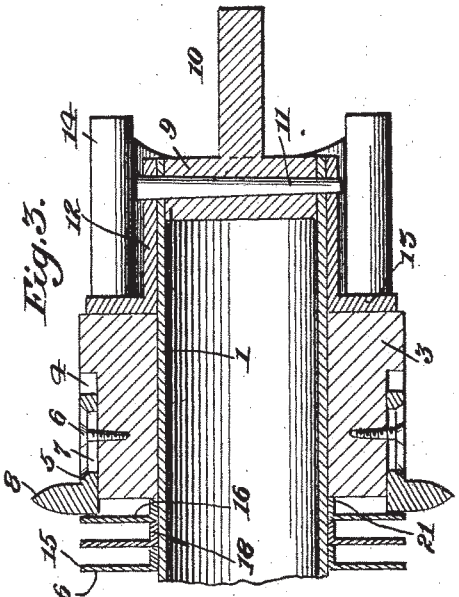

Fig. 3.

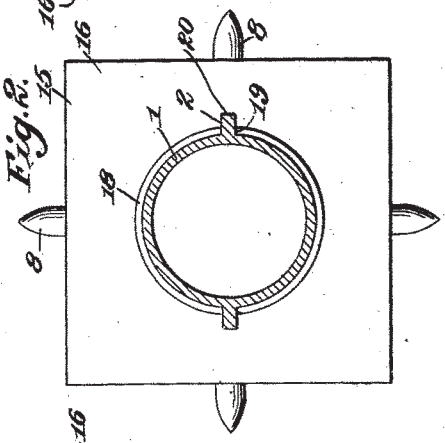

Fig. 2.

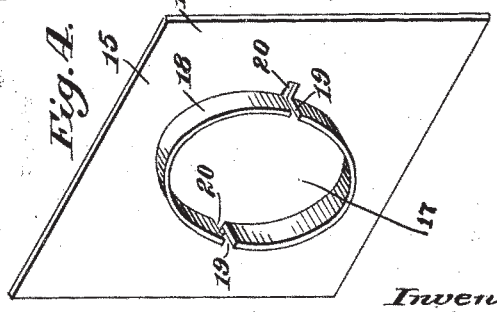

Fig. 4.

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Patented Aug. 19, 1930 1,773,305

UNITED STATES PATENT OFFICE

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JACQUARD-LOOM CYLINDER

Application filed February 15, 1929. Serial No. 340,176.

This invention relates to an improved cylinder for Jacquard looms and has as its primary object to provide a cylinder so constructed that the disadvantages presented by the ordinary cylinder, heretofore used, will be overcome. More specifically the invention relates to an improvement in cylinders of this type which are of rectangular form as distinguished from truly cylindrical cylinders, and in which the pattern cards are presented successively to different sides of the cylinder, means being provided for imparting rotary motion to the cylinder for a quarter of a revolution as successive pattern cards are brought into active position. Heretofore cylinders of this type have been constructed with their four sides provided each with a plurality of rows of openings, some of which are closed by the pattern card and others exposed by the registration of the openings in the card, therewith. In the operation of such a cylinder, the cylinder is moved toward the needles and movement of all needles the ends of which engage the imperforate portions of the pattern card is thus effected, the needle ends which are opposite the perforations in the pattern card and in the side of the cylinder being permitted to pass through these perforations and these needles therefore remaining idle. One disadvantage of this construction is that if there is any slight displacement of the cylinder in its movement toward the needles, one or more of the needles will be out of alinement with the openings in the side of the cylinder into which it is intended they shall enter with the result that the ends of these needles strike the surface of the said side of the cylinder and are bent or distorted. The present invention, therefore, contemplates the provision of a cylinder of this type which will not present this disadvantage and which will, therefore, ensure against the interruptions and repairs which are occasioned in the operation of the old type of cylinder.

Another disadvantage presented by the old type of cylinder is that, if the end of one or more needles strike the side of the cylinder instead of passing through the opening or openings therein and the needle or needles, is or are not in themselves distorted, the side of the casing, adjacent to the opening or openings is liable to be dented or otherwise distorted, and, as a consequence, it becomes necessary to completely replace this side of the cylinder or the entire cylinder, if the sides are integrally connected. Therefore, the present invention has as a further object to, first, provide a cylinder so constructed that there will be little likelihood of impact of the cylinder with the needle points, and, second, to so construct the cylinder that it will embody a plurality of members or units so assembled upon a suitably supported shaft that anyone of the members may be removed, if damaged, and a new one substituted therefor without any considerable disturbance of the other members.

In the accompanying drawing,

Fig. 1 is a view in elevation of a Jacquard loom cylinder.

Fig. 2 is a vertical transverse sectional view taken substantially on line 2—2 of Fig. 1 looking in the direction indicated by the arrows.

Fig. 3 is a longitudinal sectional view on the line 3—3 of Fig 1 and illustrates one end of the cylinder in section.

Fig. 4 is a perspective view of one of the body units or elements of the cylinder.

The cylinder embodying the invention comprises a hollow cylindrical shaft or core 1 which is, of course, of metal and which, for a purpose to be presently explained, is formed upon its outer side with diametrically oppositely located, longitudinally extending ribs indicated by the numeral 2. In order that the shaft 1 may be mounted for rotation successively through quarter turns and also supported for movement bodily toward and from the needles by mechanism which is well known in the art, a head comprising a section 3 is fitted to each end of the shaft 1, these heads constituting means, as will presently be more fully explained, for holding the body units of the cylinder on the shaft. The heads 3 are of rectangular form and a recess 4 is formed in each face of each head and a plate 5 is disposed within the recess and held adjustably in place by means of a screw

6 which is fitted through a slot 7 formed longitudinally in the plate, the screw being threaded into the head 3 and the plate being confined between the side walls of the respective recess so that it may be adjusted longitudinally therein. The recesses 4 open through the inner faces of the respective heads 3 and therefore, the plates 5 may be adjusted so that one end of each plate may be caused to project greater or less distances beyond the inner face of the respective head and each plate is formed upon this end with a pin 8 which is preferably of conoidal form, the pins engaging in ring perforations in tapes which are arranged at the margins of the pattern cards. These tapes, are common in the art, and by reason of their engagement with the pins, constituting means for connecting the pattern cards in a series and for feeding the cards one by one so as to effect successive vertical disposal of the sides of the cylinder and successive cards in position presented toward the needles. As this arrangement of cards is well known, it has not been illustrated in the drawing of the present application as the invention resides more particularly in the construction of the cylinder.

In order that the shaft 1 may be properly mounted, a circular head 9 is fitted in each end of the shaft, the shaft ends projecting beyond the outer sides of the heads 3, and a trunnion 10 is formed upon the outer face of each head 9 and located axially with respect thereto. The projecting ends of the shaft 1 and the heads 9 are formed with registering openings and a tapered key 11 is driven into these openings, at the time of assembling the component parts of the cylinder, so that the trunnion carrying heads 9 are securely assembled with the ends of the shaft, it being understood that the trunnions are mounted in bearings capable of supporting the cylinder for the rotating and shifting movement above referred to. In order that the ends of the shaft may be supported in a stable manner after each quarter revolution of the shaft and the cylinder thereon, a rectangular housing 12 is fitted onto each projecting end of the shaft and is provided with a flange 13 which is secured by screws or otherwise to the outer face of the respective head 3. This housing may be held in place upon the shaft through the medium of the key 11 or any other suitable manner and in order that the housing may be supported upon a slide for bodily shifting movement of the cylinder, as a whole, rounded runners 14 are provided extending laterally from the four corners of the flange 13, so that two of these runners are presented at each side of the cylinder, as a whole, and after each quarter of a revolution of the cylinder two of the runners at each end of the cylinder and at that side thereof which is pressed downwardly, at this time, will engage upon the said slides.

The body of the cylinder is made up of a number of body units which are indicated in general by the number 15 and each of which comprises a rectangular metal plate 16 formed centrally with a circular opening 17, the material of the plate being struck up at one side of the plate and about the said opening so as to provide a substantially circular spacing flange 18 and, in order, that the plates 16 may be fitted to the shaft 1 and held against any rotative displacement thereon, the flange 18 is formed at diametrically opposite points with notches 19, and notches 20, similarly located, are formed in the plate 16 at corresponding points in the wall of the opening 17 in said plate, the notches 19 and 20 when the plates are fitted onto the shaft, receiving the ribs 2 upon the shaft so that the plates are as stated securely held against any rotative displacement. Preferably the plates are arranged in two series and it will be understood at this point that the flange 18 of each plate will abut at its edge against that side of the next adjacent plate opposite the side from which the flange of the last mentioned plate projects, a spacing collar 21 being fitted onto the shaft 1 at each end of the series of body units to seat between the inner face of the respective head 3 and the face of the respective end-most plate 16 of the series so that this plate will be spaced from the face of the head 3 and, likewise, the plates will be spaced from one another, uniform distances throughout the entire assemblage.

As above stated it is preferable to arrange the units 15 in two series and the units of each series are located between one of the heads 3 and a spacing member 21 which is of rectangular marginal contour and which is fitted and held upon the shaft 1 in the same manner as are the units 15. This member 21 is of a thickness substantially equal to the width of the space between any two of the units 15 and, due to the peculiar arrangement of the units 15 in which their flanges 18 are, in both series, presented toward the inner ends of the series, the flanges of the inner-most units of the two series will abut against the adjacent faces of the member 21. The spacing member 21 is preferably formed with a groove 22 in each of its four edges and these grooves communicate with one another at their ends, and similar grooves 23 are formed in the heads 3, the grooves 22 accommodate the intermediate tape of the cards which connects the intermediate portions of the pattern cards, and the grooves 23 accommodate the side or marginal tapes of the cards.

The cards which will be employed in connection with the cylinder of the invention are, of course, the same as the cards ordinarily employed in connection with a rectangular cylinder employed on a Jacquard

loom, but it will be evident that, in the instance of the present invention, the construction of the body of the cylinder by the use of a shaft and body elements such as the elements 15, presents a decided advantage over the old construction in that if there is any slight displacement of the cylinder or any slight displacement of any one of the needles, no damage will be sustained by any of the parts due to the fact that the cylinder of the invention practically presents, at each of its faces, a series of parallel, unobstructed channels or guides. Even if there should be any impact of one of the edges of any one of the plates 16 with any of the needles, and any damage resulted from such impact, to the plate, the damage may be remedied by merely temporarily removing that one of the keys 11 which is nearest the damaged plate and then slipping the corresponding head 3 and housing 12 from this end of the shaft and then removing or slipping the units from the shaft which units extend in a series up to and including the damaged unit. A new unit may then be substituted for the damaged unit or the damaged unit repaired, and it and the other units are fitted onto the shaft, after which of course the head 3 and parts associated therewith are replaced.

It will further be evident from the foregoing description that the formation of the flanges 18 directly from the material of the plates 16 which comprise the body units, provides for a more substantial mounting of the plates 16 on the shaft and is likewise more economical to produce than would be the case if spacing collars, independent of the plates, were employed. While the units 15 are illustrated in the drawing as rectangular in form, it will be understood that the invention is not restricted to plates of precisely this marginal contour and, therefore, where the term "cylinder" is employed, its use, is in the sense that this term is commonly applied to this part of a Jacquard loom.

It is obvious that minor changes in the form, construction, size, combination and arrangement of the component parts of the invention may be made and substituted for those shown and described without departing from the nature and principles of the invention.

What I claim is:

1. A cylinder for Jacquard looms the body of which comprises a plurality of units mounted in mutually spaced relation, the margins of said units constituting the surface of the cylinder and the spaces between said units permitting entry of the needles.

2. A cylinder for Jacquard looms comprising a body which comprises a plurality of substantially flat units mounted in mutually spaced relation, corresponding marginal portions of all of said units being correspondingly arranged with respect to the axis of the cylinder and the margins of said units constituting the surface of the cylinder and the spaces between said units permitting entry of the needles.

3. A cylinder for Jacquard looms the body of which comprises a plurality of flat units of polygonal marginal contour mounted in mutually spaced relation, corresponding marginal portions of all of said units being correspondingly arranged with respect to the axis of the cylinder and the said margins of the units constituting the surface of the cylinder and the spaces between said units permitting entry of the needles.

4. A cylinder for Jacquard looms the body of which comprises a plurality of flat units arranged in a series and provided with means coacting with relatively adjacent units to effect mutual spacing of the units, the margins of said units constituting the surface of the cylinder and the spaces between said units permitting entry of the needles.

5. A cylinder for Jacquard looms the body of which comprises a plurality of substantially flat units, a shaft upon which the units are assembled in a series, and means upon said units coacting with adjacent units for maintaining the units in mutually spaced relation to one another, the margins of said units constituting the surface of the cylinder and the spaces between said units permitting entry of the needles.

6. A cylinder for Jacquard looms comprising a shaft, a plurality of flat body units mounted upon the shaft in mutually spaced relation to one another, means for maintaining the units against rotative displacement upon the shaft, the units having a polygonal marginal contour and the margins of said unit constituting the surface of the cylinder and the spaces between said units permitting entry of the needles.

7. A cylinder for Jacquard looms the body of which comprises a plurality of flat units each having substantially rectangular marginal contour, a shaft upon which the units are assembled in a series, means for restraining the units against rotative displacement upon the shaft, means mutually spacing the units, corresponding marginal portions of all of the units occupying common planes and the margins of said units constituting the surface of the cylinder.

8. A cylinder for Jacquard looms the body of which comprises a plurality of relatively flat units of polygonal marginal contour, a shaft upon which the units are mounted and assembled in a series, each unit having an axially located opening to accommodate the shaft, and the units being provided each with a laterally projecting flange fitting the shaft, the free edges of the flanges of each unit abutting the adjacent unit of the series whereby to relatively space the units throughout the

series, the margins of said units constituting the surface of the cylinder.

9. A cylinder for Jacquard looms comprising a shaft having means whereby it may be mounted for rotation, heads upon the shaft having pattern card engaging means to effect the feeding of the usual card in the rotation of the cylinder, one of said heads being removable and a plurality of spaced body units fitted to the shaft, the margins of the units constituting the body surface of the cylinder and the said units being confined by said heads and removable from the shaft upon removal of the said one of said heads.

10. A cylinder for Jacquard looms comprising a shaft having means whereby it may be mounted for rotation, heads upon the shaft having pattern card engaging means to effect the feeding of the usual card in the rotation of the cylinder, one of said heads being removable and a plurality of spaced body units fitted to the shaft, means uniformly spacing the units, the margins of the units constituting the body surface of the cylinder and the said units being confined by said heads and removable from the shaft upon removal of the said one of said heads.

11. A cylinder for Jacquard looms comprising a body formed of a series of thin plates and means for holding said plates in spaced relation.

12. A cylinder for Jacquard looms comprising a body formed of a series of thin plates, means upon each plate coacting with an adjacent plate for maintaining the plates in spaced relation and means for holding said plates in assembled relation.

13. A cylinder for Jacquard looms comprising a body formed of a series of thin plates, an abutment upon each plate coacting with an adjacent plate to hold said plates in spaced relation and means for maintaining said plates in assembled relation.

14. A cylinder for Jacquard looms comprising a shaft, a series of thin plates mounted upon said shaft and means for maintaining said plates in spaced relation.

15. A cylinder for Jacquard looms comprising supporting means, a series of thin plates mounted upon said supporting means and means for maintaining said plates in spaced relation so that the needles can enter the spaces between said plates.

16. A cylinder for Jacquard looms comprising supporting means, a series of thin plates mounted upon said supporting means and a collar between each of said plates for maintaining said plates in spaced relation so that the needles can enter the spaces between said plates.

17. A cylinder for Jacquard looms comprising supporting means, a series of thin plates mounted upon said supporting means and a collar upon each of said plates extending at right angles to the body of each plate for maintaining said plates in spaced relation so that the needles can enter the spaces between said plates.

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

CHARLES A. FISHER.