

No. 782,500.

PATENTED FEB. 14, 1905.

C. HANDWERCK.

LASHING DEVICE FOR CARD PUNCHING MACHINES.

APPLICATION FILED JULY 9, 1903.

3 SHEETS—SHEET 1.

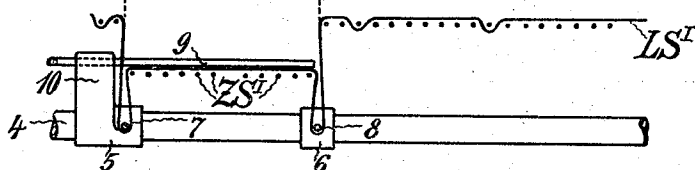
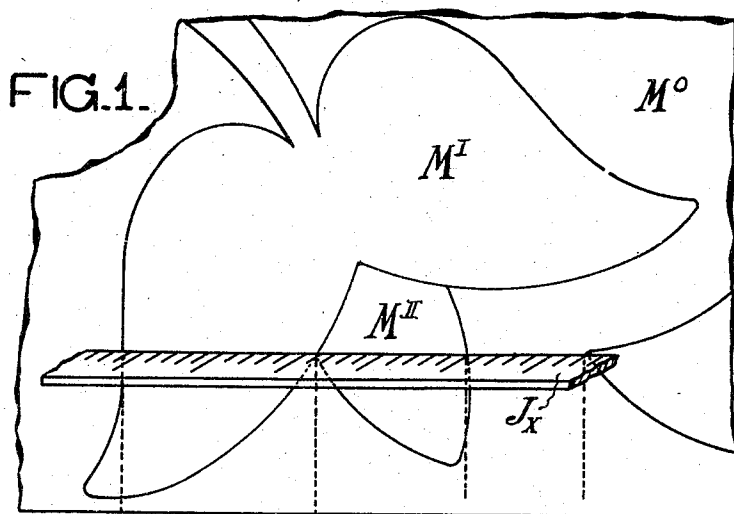


FIG. 2.

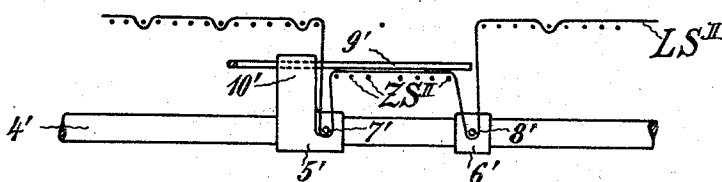
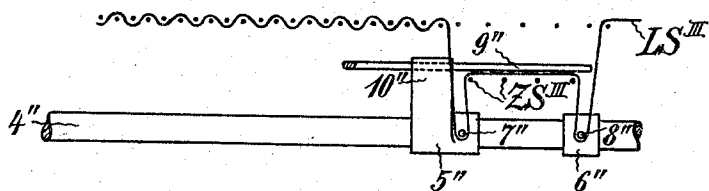


FIG. 3.



WITNESSES

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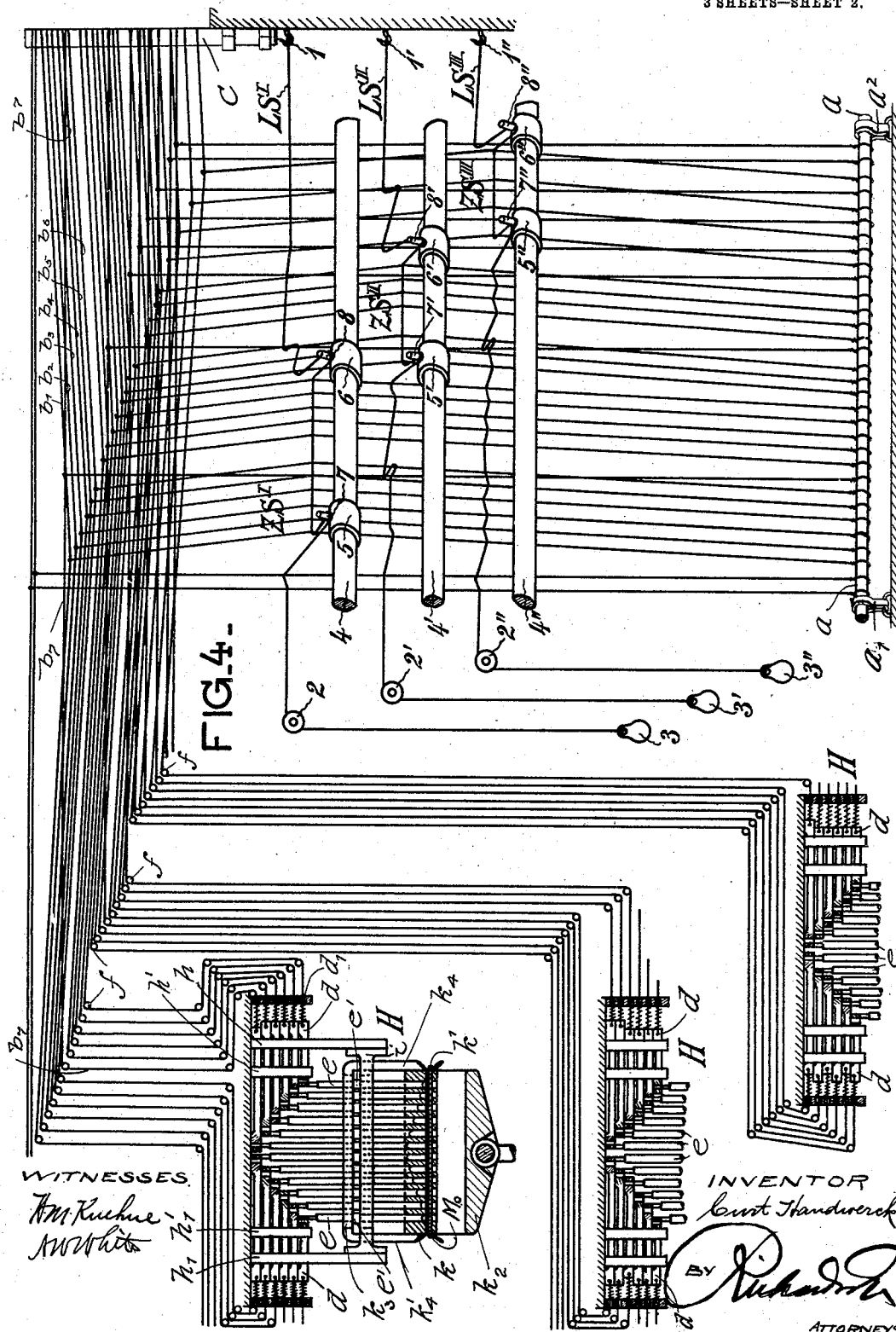
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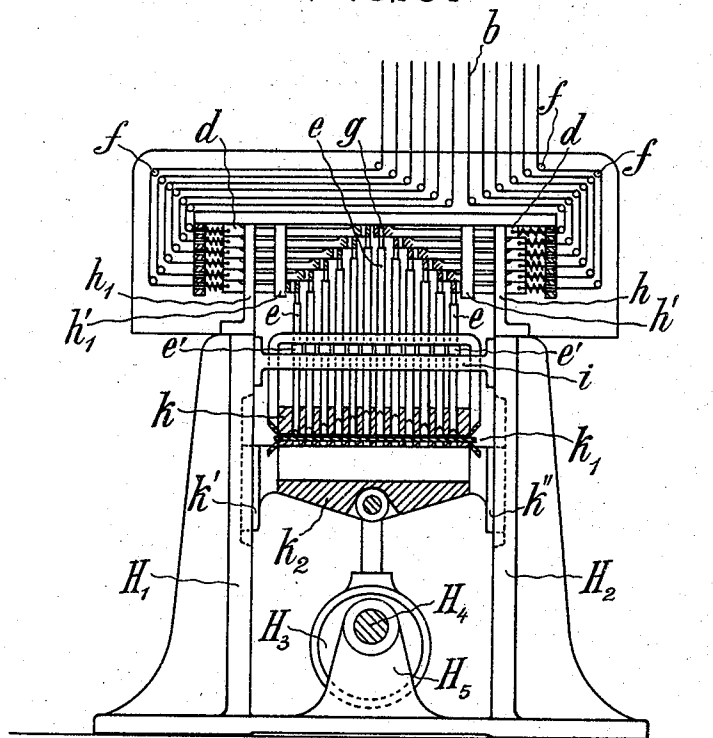
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3 SHEETS—SHEET 3.

FIG. 5.



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CURT HANDWERCK, OF LEIPSIC, GERMANY.

LASHING DEVICE FOR CARD-PUNCHING MACHINES.

SPECIFICATION forming part of Letters Patent No. 782,500, dated February 14, 1905.

Application filed July 9, 1903. Serial No. 164,855.

To all whom it may concern:

Be it known that I, CURT HANDWERCK, a subject of the Emperor of Germany, residing at 22 Carolinenstrasse, Leipsic, in the Kingdom of Saxony and Empire of Germany, have invented new and useful Improvements in Lashing Devices for Card-Punching Machines, of which the following is a specification.

My invention relates to a lashing device for card-punching machines for the manufacture of pattern-cards by means of drawings of the design which have no bindings, use being made of a ruler the position of which in front of the drawing of the design indicates the respective weft-line, while the division provided on the ruler marks the several points of design in the weft-line.

The improved lashing device, the construction of which resembles that of a simple loom, is represented in the accompanying drawings, wherein—

Figures 1 to 3 are diagrams showing horizontal sections of the same, and Fig. 4 is a diagram showing an elevation of the same with devices for introducing the bindings put in connection with a card-punching machine of known construction. Fig. 5 shows a representative example of the entire punching machine.

M designates the drawing of the design, J^x the ruler, and H the card-punching machine. For the sake of clearness the division of the points of design in the drawing of the design is made as large as the division of the simple cords ZS. By way of example I have represented the adjustment of the weft-shed of the fabric, which corresponds to the weft-line indicated by the ruler J^x. For each differently binding part of the drawing of the design there is a set of lash-cords LS, the number of which corresponds to a repetition of bindings. In Fig. 1 the part M^I of the drawing of the design has satin binding, the part M^{II} has twill binding, and the ground M has linen binding. The groups of lash-cords LS^I, LS^{II}, LS^{III}, appertaining to the several parts of the drawings of the design, are interlaced in the groups according to the binding with the simple cords ZS^I, ZS^{II}, ZS^{III}, as shown in Figs. 1, 2, and 3, for the uppermost lash-cord

of each of the three groups. The lash-cords are fastened so as to yield, being attached on the one hand, for example, to hooks 1 1' 1'' and on the other hand conducted over rolls 2 2' 2'' and having weights 3 3' 3'' suspended from their free ends to produce tension. In order to facilitate the finding of the simple cords in the lashing, a ruler corresponding to the ruler arranged in front of the drawing of the design is provided in front of each group. This arrangement is not represented, because in the diagram the division of the drawing of the design agrees with the division of the simple cords and would cover too much the arrangement of the rulers on the groups of lash-cords. According to the drawing of the design and having regard to the binding for the respective part of the weft-line or the repetition, of the same, it is necessary in the lashing to separate, with the aid of the corresponding lash-cord LS, the simple cords to be used for the part of the drawing of the design—for instance, the simple cords ZS^I in Fig. 1, the simple cords ZS^{II} in Fig. 2, the simple cords ZS^{III} in Fig. 3 from the other simple cords not corresponding to the respective parts of the drawing of the design. It is clear and also evident from the diagrams that the respective binding-points drop out, inasmuch as the simple cords ZS appertaining to them remain in their position of rest.

As the lashing of the pattern according to the drawing of the design can take place only in succession for the several parts of the drawing of the design, it should be possible to fix the lashing for such a part as has at any time been finished. For this purpose I provide in front of each group of lash-cords a rod 4, 4', or 4'', arranged to be displaced parallel to itself in the vertical direction and upon which slide-rings 5 6 or 5' 6' or 5'' 6'' can be adjusted. These slide-rings have pins 7 8 or 7' 8' or 7'' 8'', over which the lash-cord drawn forward is laid. As shown in Figs. 1 to 3, it is expedient to connect with each slide-ring a ruler 9, adapted to be displaced parallel to the corresponding rod 4 in an arm 10 on the slide-ring 5. After the adjustment of the respective lash-cord the ruler 9 is pushed behind the drawn-out simple cords ZS after the respec-

tive gut-cords LS have been adjusted in order to prevent the former from moving back. Ruler 9 serves, further, as an appropriate and safe support for the drawn-out simple cords ZS. The gut-cord LS alone cannot fulfil this purpose, as it is bent backward by the tension of the simple cords on account of its flexibility. On the other hand, all the simple cords ZS which lie close to ruler 9 are arranged in one straight line. In this manner the simple cords rise all to exactly the same height.

The large rule J^x serves with its division solely for fixing the warp-lines for the respective weft-line of the design for which the card has to be punched. The purpose of rule 9 will be further explained as follows: Fig. 4 shows that the simple cords ZS are attached with their lower ends to rod *a*, secured to the floor by means of holders *a*₁ *a*₂. The simple cords connect here with horizontal cords *b* in the same manner like in all other simple looms. The horizontal cords are fastened with one end to a perpendicular stationary rod *c* and run over rolls *f*. From their other ends are suspended in the present case the abutment-slides *d* for stamps *e* of punching-machine H. The abutment-slides *d* slide in guides *h* *h'*, respectively, *h*₁ *h'*₁, and are provided with springs *d*₁, which press them into the position of rest. In this position aperture *d*₂, provided in abutment-slide *d*, is placed before the end of stamp *e*, belonging thereto. As slides *d* are pressed into the position of rest by springs *d*₁ they pull upon cords *b*. As long as the simple cords ZS are stretched the gut-strings *b* remain also extended. However, if simple cords ZS are drawn forth according to the design, and thus shortened in their length, as shown in Fig. 4, then the gut-strings *b*₁ *b*₂ *b*₃ *b*₄, belonging thereto, are likewise drawn through, and thus shortened, so that the abutment-slides *d*, suspended therefrom, are pushed forward, their aperture *d*₂ being drawn away from in front of the corresponding stamp *e*. For example, in Fig. 4 simple cord ZS for the gut-string *b*₁ remains in its stretched position. Consequently *b*₁ is likewise stretched and aperture *d*₂ in the abutment-slide *d* belonging thereto is placed before stamp *e*, allowing thus the latter to be moved back without difficulty. Stamps *e* are arranged in a stationary punching-plate *i*. The front ends of the stamps extend into a punching-plate *k*, firmly connected with a pressure-bar *k*₂ and provided with slit *k*₁ for card M⁰ to be punched. Stamps *e* are further provided with bands *e'*, serving as stops against the stationary rail *i*. In the rear of these stamps engages punching-plate *k*₃, connected, by means of arms *k*₄ *k*_{4'}, with punching-plate *k*, respectively, with pressure-bar *k*₂. Fig. 5 shows that pressure-bar *k*₂, with slide-shoes *k'* *k*, is free to move guides *h*₁ *h*. The movements of the pressure-bar are controlled by eccentric H₃, keyed on shaft H₁, said shaft resting in bearings H₂ of

the guide-frame H₁ H₂, so that it can be operated either by hand or by machinery. If the pressure-bar advances toward stamps *e*, the card is inserted into slit *k*₁. All those stamps *e* which do not find M⁰, which has to be punched in their abutment, are prevented by said abutment from moving backward and punch, therefore, the card, while those stamps before which the aperture of their abutment is placed are pushed forward by the card without punching the latter.

With the aid of this simple device the outlines of the bindings may also be kept clear, it being only necessary for the lasher to separate from the simple cords to be drawn forward as many of the limiting-points of design as are to remain free from bindings, having regard to the binding-points in the simple device, which serves as a binding device, the number of these points of design which is considered requisite being stated in the drawing of the design. Moreover, the introduction of bindings of threads not forming the design at any time among the others is rendered possible by the described device. However, it is necessary for this purpose to provide special groups of lash-cords for the introduction of further bindings.

The lash-cords of the groups of bindings may be interlaced by hand; but this may also be effected rapidly by a Jacquard device connected with the simple cords and forming a shed into which the lasher need only place the cord.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A lashing device of the character described, comprising a drawing of the design without bindings, a ruler having divisions for indicating the closeness of the weft, such ruler being placed in front of the said drawing of the design, simple cords corresponding in number to the divisions on the ruler, and sets of lash-cords corresponding to the different bindings, substantially as and for the purpose herein set forth.

2. A lashing device of the character described, comprising a drawing of the design without bindings, a ruler having divisions for indicating the closeness of the weft, such ruler being placed in front of the said drawing of the design, simple cords corresponding in number to the divisions on the ruler, and sets of lash-cords corresponding to the different bindings and attached at one end to hooks and weighted at the other end, substantially as and for the purpose herein set forth.

3. A lashing device of the character described, comprising a drawing of the design without bindings, a ruler having divisions for indicating the closeness of the weft, such ruler being placed in front of the said drawing of the design, simple cords corresponding in number to the divisions on the ruler, sets of lash-cords corresponding to the different bindings, a rod arranged in front of each group of lash-cords,

slide-rings adapted to be adjusted on the said rod and having pins over which the lash-cords drawn forward are laid, substantially as and for the purpose herein set forth.

- 5 4. A lashing device of the character described, comprising a drawing of the design without bindings, a ruler having divisions for indicating the closeness of the weft, such ruler being placed in front of the drawing of the
10 design, simple cords corresponding in number to the divisions on the ruler, sets of lash-cords corresponding to the different bindings, a rod arranged in front of each group of lash-cords, slide-rings adapted to be adjusted on the said

rod and having pins over which the lash-cords 15 drawn forward are laid, an arm on the slide-rings, and a ruler adapted to be displaced parallel to the said rod in front of the lash-cords, substantially as and for the purpose herein set forth. 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CURT HANDWERCK.

Witnesses:

RUDOLPH FRICKE,
R. V. C. DUNN.