H. B. HARRISON.

FOLDING MACHINE.

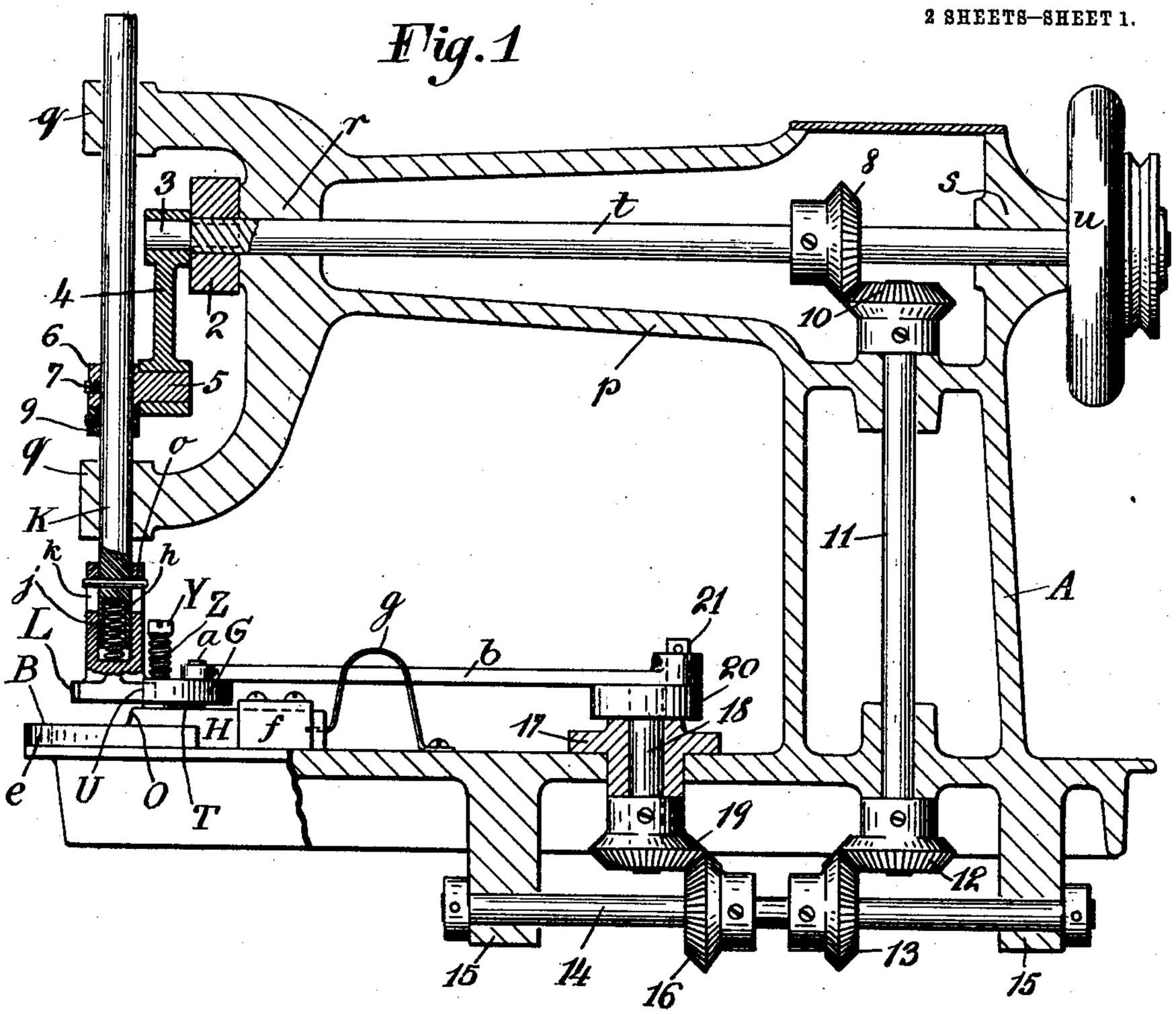
APPLICATION FILED MAR. 4, 1911.

997,998.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

Fig. 1



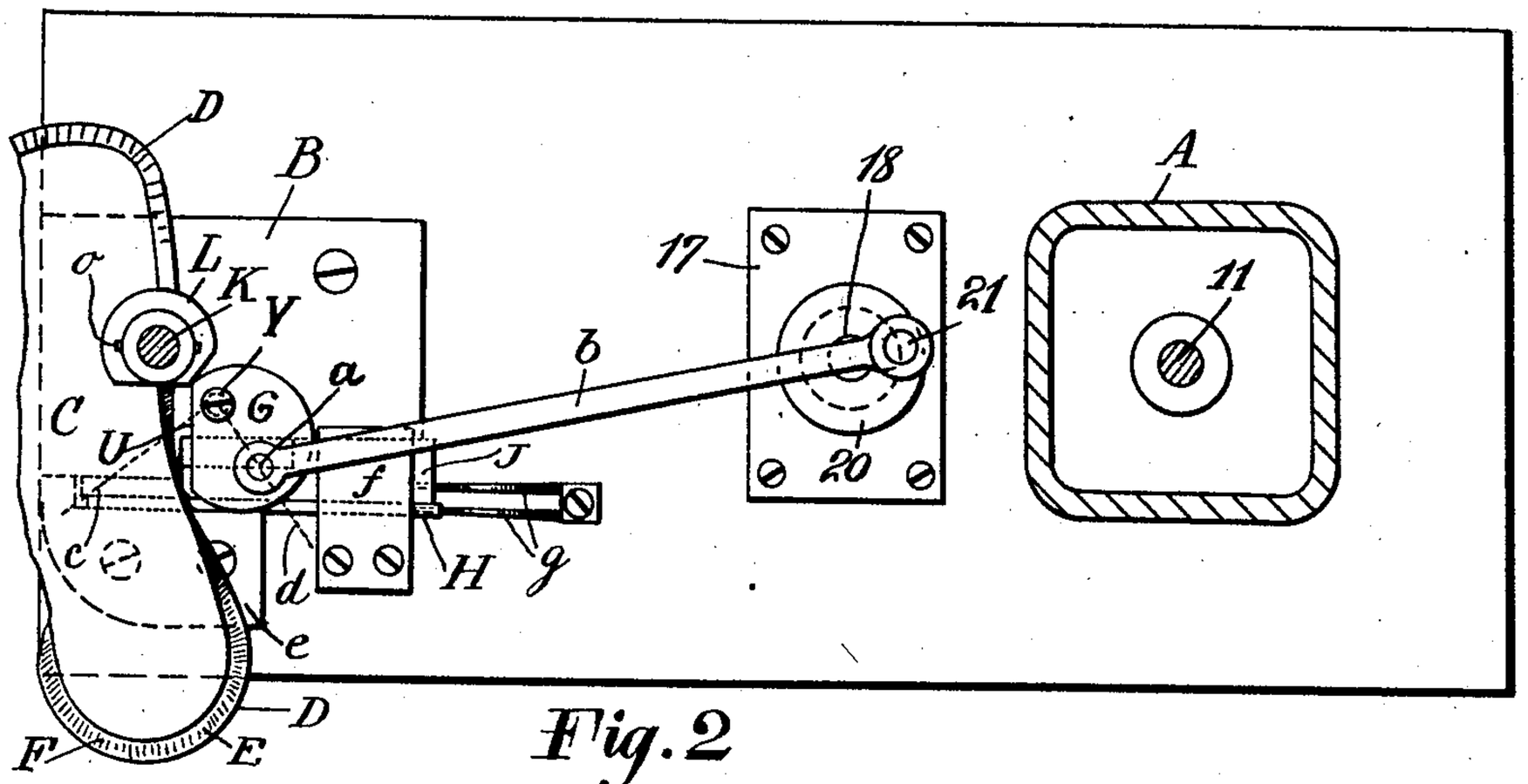


Fig. 2

Witnesses:
W. W. Riemann
A. C. Parkhurst

Inventor
Henry B. Harrison
By his Attorney
Herbert E. Ogden

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 3

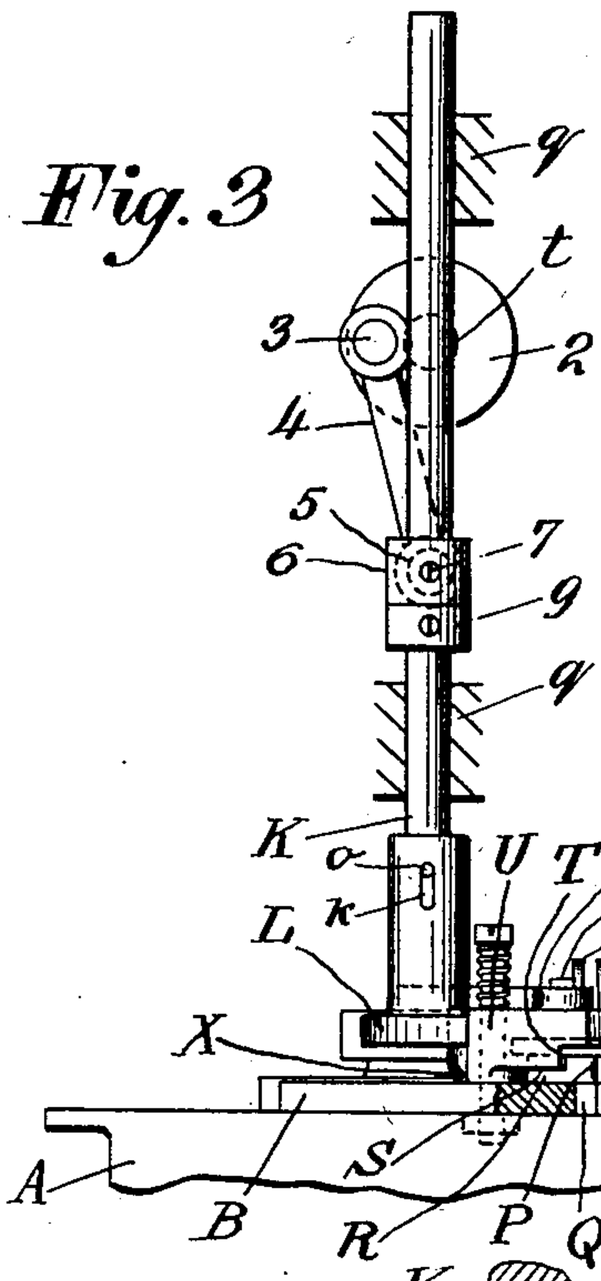


Fig. 5

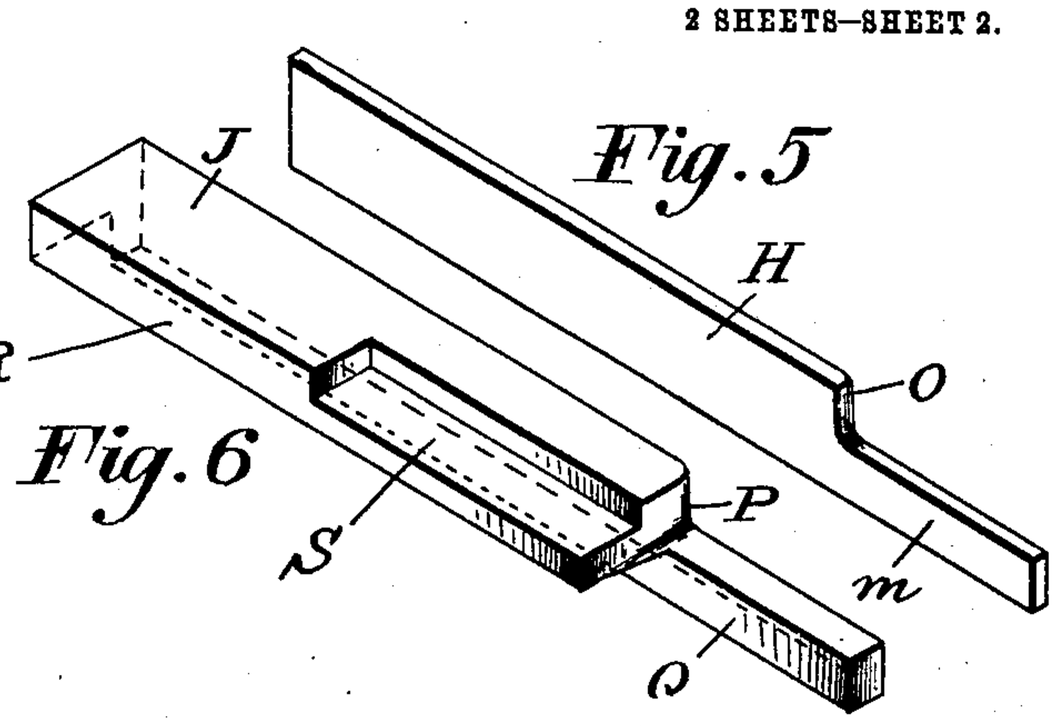


Fig. 6

Fig. 7

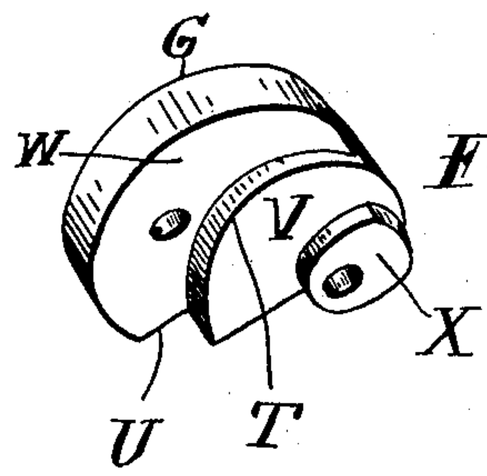
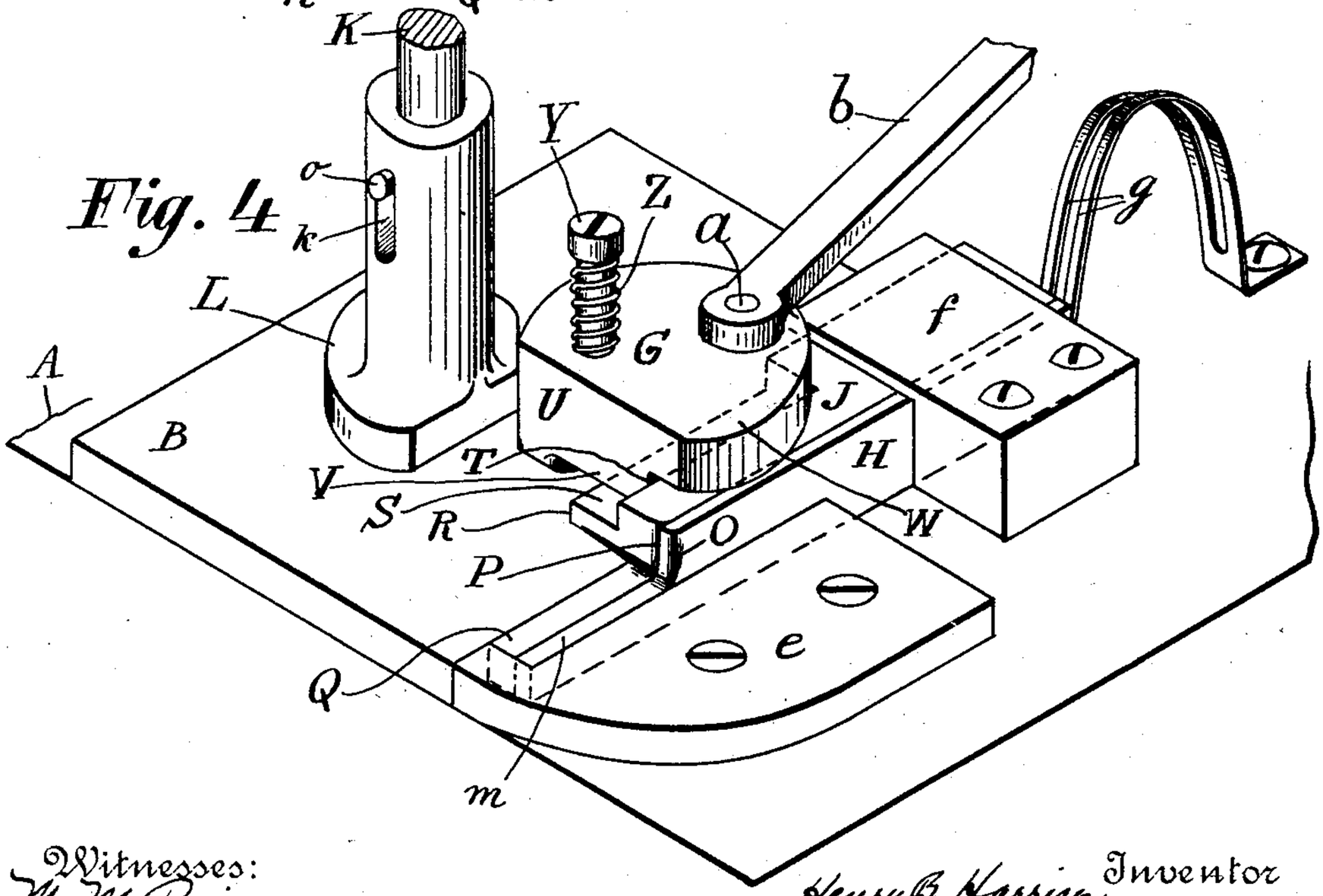


Fig. 4



Witnesses:
M. M. Pinnann
A. C. Parkins.

Inventor
Henry B. Harrison
By his Attorney
Herbert E. Ogden

UNITED STATES PATENT OFFICE.

HENRY B. HARRISON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO DAVID I. ROGOW, OF NEW YORK, N. Y.

FOLDING-MACHINE.

997,998. Specification of Letters Patent. **Patented July 18, 1911.**

Application filed March 4, 1911. Serial No. 612,365.

To all whom it may concern:

Be it known that I, HENRY B. HARRISON, a citizen of the United States, and a resident of Worcester, Massachusetts, have invented certain new and useful Improvements in Folding-Machines, of which the following is a specification, accompanied by drawings.

This invention relates to folding machines, but more particularly to folding machines for folding the margin of the facing material over the edges of a sole, and pressing said material upon the sole. The machine may, however, be used for any folding or pressing operations to which it may be found applicable, and is not limited in its uses to folding the edges of the facing material upon the soles.

The objects of the invention are to improve upon the construction of such machines, simplify the parts and increase the efficiency, while enabling a greater amount of work to be done in a given time than heretofore, at less expense.

To these ends the invention consists of a machine for carrying out the above objects, embodying the features of construction, combinations of elements and arrangement of parts, having the general mode of operation substantially as hereinafter fully described and claimed in this specification and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine partly in section; Fig. 2 is a plan view with the frame partly broken away; Fig. 3 is a front elevation of the machine; Fig. 4 is a perspective view of the folding mechanism; Fig. 5 is a perspective view of one guide member; Fig. 6 is a perspective view of another guide member; and Fig. 7 is a perspective view of the wiper.

Referring to the drawings, A represents the frame of the machine and B represents the bed or table to receive the work. In the drawing on the plan view, Fig. 2, the position of a sole C for a slipper or other article of foot wear is indicated, which sole is passing through the machine, while the edges D of the facing material E are being folded and pressed upon the sole. The edges of the facing material E are first preferably provided with mucilage F so that said material will adhere to the sole.

A suitable guide preferably formed in sections or members for a purpose hereinafter to appear, enables the edges D of the facing material E to be accurately folded over upon the sole C. The sections of the guide are shown in perspective views in Figs. 5 and 6, in this instance there being two sections or members, of a suitable conformation and construction to carry out the objects of the invention. These guide members H and J, which together form the guide, in this instance extend longitudinally of the machine and transversely to the line of movement of work, so that the edges of the sole may be pressed against the end of the guide to turn up the edges D of the facing material E.

A wiper G preferably in the form of a disk is mounted adjacent the guide members and connected to be automatically reciprocated horizontally over the edges of the sole in order to turn or fold the edges D of the facing material E down upon the sole. A suitable hammer or presser in the form of a vertically reciprocating rod K is provided with a presser foot L and mounted adjacent the wiper G. Means are provided for vertically reciprocating the presser and presser foot in order to press the facing material upon the sole and cause it to adhere to the sole. Any suitable means hereinafter to be described may be provided for actuating the wiper and the presser and said actuating means are so constructed and timed in their operations that the downward stroke of the presser foot L is completed as the wiper G completes its forward stroke. By this means the presser foot L presses upon the work as the wiper G starts to recede on its back stroke, thus holding the work in position as the wiper recedes.

The construction of the guide members H and J, the wiper G and the presser K and presser foot L and the relative arrangement and location of said parts may be varied as desired, but I have illustrated in the drawings a suitable construction and arrangement of the parts which has been found to act satisfactorily and well for the purposes for which the machine is intended. The outer guide H in this instance comprises a bar of metal having a curved shoulder O and a reduced portion *m* of substantially the thickness of the bed or table B. The inner guide J is preferably wider than the outer guide H and is also provided with the curved shoulder P normally in line with

the shoulder O of the guide member H. The guide member J is also provided with the reduced portion Q and the overlying flange R adapted to lie on top of the table B. The guide member J is also preferably provided with the recessed portion S into which extends the wiping edge T of the wiper G. The wiper is preferably in the form of a disk cut away or flattened at one side U and having a stepped construction, the high portion V of which is provided with the curved wiping edge T. The low portion W of the disk preferably extends over the guide members H and J. The wiper G as shown is provided with the boss X on its under side through which extends the pivot pin Y into the bed of the machine. A compensating spring Z is preferably provided between the head of the pivot pin and the top of the wiper in order to provide for inequalities in the work. A connecting rod stud *a* is provided upon the wiper to which is connected the connecting rod *b* adapted to be actuated from a source of power in order to reciprocate the wiper horizontally about the pivot pin Y. The parts are so constructed that the wiper is reciprocated through substantially an angle of 90° indicated by the dotted lines *c* and *d*.

The guide members H and J as shown are mounted side by side between the table B and the clamping member *e*. A guide cap *f* as shown holds the rear portions of the guide members in position. The guide members may slide longitudinally of their length beneath the guide cap *f* and suitable springs *g* press the guide members forward. The edge of the sole is pressed against the shoulders O and P and owing to the fact that the guide members are independently movable, the shoulders conform to the curve of the end of the sole and accurately turn up the edges D of the facing material E. At the instep and heel of the sole, the guide members H and J would obviously assume different relative positions owing to the difference in the curve of the edge of the sole at these two portions. Both guide members may recede at the same time or one may recede while the other is moving forward and vice versa so that at all times the edge of the sole abuts against a turning surface at the shoulders O and P. This is one of the important features of my invention and owing to the construction and arrangement of the guide members, I am enabled to do more rapid work and more accurate work on my machine than heretofore.

The wiper, continually reciprocating horizontally, forces the upturned edge D of the facing material E down upon the pasted edge of the sole, and the presser foot continually stamps the down-pressed edge upon the sole to maintain it in position on the finished article. The combined action of the guide members H and J and the wiper G turns and folds the edge D of the facing material and crimps it to conform to the curve of the sole. The presser foot L flattens the crimped portions of the facing material and produces a neat finish for the article.

The presser K in the form of a rod is preferably provided with a hollow end *h* in which is provided a compression spring *j*. The presser foot L is in the form of a cap extending over the lower end of the presser rod K and through the slots *k* in the presser foot and through an aperture in the presser rod is passed the pin *o*, so that the presser foot L may have vertical play on the presser rod.

Any suitable driving connections may be provided for actuating the wiper and the presser, in this instance the frame A of the machine being provided with the horizontal arm *p* having the vertical guide bearings *q* for the presser rod K. Mounted in bearings *r* and *s* in the frame is the driving shaft *t* provided with the combined balance and driving wheel *u* through which power is applied as by means of a belt. On the outer end of the driving shaft *t* is provided the crank disk 2 having the crank pin 3 to which is connected the pitman 4 pivoted at its lower end to the pin 5 adjustably mounted on the presser rod K as by means of the sleeve 6 and set screws 7. A suitable stop in the form of a collar 9 may be clamped below the collar 6 upon the rod K.

The driving shaft T may be provided with suitable bevel gear 8 meshing with bevel gear 10 on the vertical shaft 11 mounted in the frame and provided with a bevel gear 12 at its lower end. Said bevel gear 12 meshes with the bevel gear 13 mounted on the horizontal shaft 14 carried in the bearings 15 and provided with a second bevel gear 16. In the vertical bearing 17 is mounted a vertical shaft 18 having the bevel gear 19 at its lower end meshing with the bevel gear 16 while at its upper end is provided the crank disk 20 having the crank pin 21 to which is pivoted the crank shaft B connected to the wiper G.

The operation of the machine is substantially as follows: Power is applied to the driving wheel *u*, thereby rotating the shaft *t*, which rotary motion is translated into a reciprocating vertical motion through the crank 2 and pitman 4 in order to vertically reciprocate the presser and presser foot L. Rotary motion is also transmitted through the vertical shaft 11, horizontal shaft 14 and short vertical shaft 18 to the crank 20, which is translated into a horizontal reciprocating motion through the crank *b* in order to horizontally reciprocate the wiper G. The machine is run at high speed and the wiper and presser foot are reciprocated rapidly.

The soles to be operated upon are fed transversely through the machine, preferably by hand, although automatic machinery could be provided for this purpose. The edges of the soles are pressed against the shoulders O and P of the guide members H and J and as the sole is turned the guide members conform to the curve of the edge and turn up the edge D of the facing material E. The wiper G continually folds the edge D down upon the sole and the presser foot continually stamps the material upon the sole.

While the guide members are in themselves an important feature of this invention, the wiper is also an important feature, for by means of the wiper the facing material is continually and accurately folded down upon the soles. The edges of the facing material E are also crimped to conform to the curve of the edges of the sole and since the parts are so timed in operation as to move the presser foot down upon the sole as the wiper completes its forward stroke, it will be seen that there is no tendency to move the sole as the wiper recedes, since it is held in position upon the table by the pressure of the presser foot. The presser foot then releases the sole, in order that it may be fed forward to bring a new portion of the material opposite the wiper. It has been found that the output of completed soles has been greatly increased by the combination of the guide members, the wiper and the presser foot, as constructed, arranged and assembled in relation to each other in this machine.

I claim and desire to obtain by Letters Patent the following:

1. In a folding machine, the combination with the frame and bed, of a longitudinally divided guide, having independent movable spring pressed portions, a wiper pivoted adjacent said guide portions, a presser, and means for operating said wiper and presser.

2. In a folding machine, the combination with the frame and bed, of a plurality of independently movable spring pressed guides, having turning surfaces at their inner ends for turning up the facing material, a horizontally reciprocating wiper, a vertically reciprocating presser, and means for actuating said wiper and presser.

3. In a folding machine, the combination with the frame and bed, of a plurality of independently movable spring pressed guides, having turning surfaces at their inner ends for turning up the facing material, a horizontally reciprocating wiper, a vertically reciprocating presser, and means for actuating said wiper and presser, said actuating means being timed to complete the downward stroke of the presser as the wiper completes its forward stroke.

4. In a folding machine, the combination with the frame and bed, of independently operating spring pressed guides, a wiper disk extending over the guides, means for reciprocating said disk about a vertical axis, a presser, means for reciprocating said presser vertically, and means for adjusting the presser relatively to the bed.

5. In a folding machine, the combination with the frame and bed, of a plurality of spring pressed guides, a wiper and means for reciprocating said wiper horizontally through a given arc, a presser having a presser foot provided with a compensating spring, and means for adjusting said presser relatively to the bed.

6. In a folding machine, the combination with the frame and bed, of a plurality of spring pressed guides, a wiper pivoted adjacent the guides and having a compensating spring, means for reciprocating the wiper horizontally, a presser and means for operating the presser.

7. In a folding and pressing machine for folding the margin of the facing material over the edges of a sole and pressing said material upon the sole, the combination with the frame and bed, of a pair of slidable spring pressed guides lying side by side and extending transversely to the line of movement of the sole to be operated upon, said guides being provided with shoulders forming guiding surfaces for guiding and turning up the edge of the facing material, a reciprocating wiper overlapping the guides and pivoted adjacent thereto, said wiper having a wiping edge for turning the facing material downwardly upon the edges of the sole, a vertically movable presser mounted adjacent the wiper for pressing the folded edge upon the sole, and means for actuating said wiper and presser, said presser being timed to operate upon the material as the wiper starts to recede on its back stroke.

8. In a folding and pressing machine for folding the margin of the facing material over the edges of a sole and pressing said material upon the sole, the combination with the frame and bed, of a pair of independently movable spring pressed guides slidably mounted side by side in the bed and provided with shoulders together forming guiding surfaces, the inner guide being provided with a longitudinal recess, a reciprocating stepped disk forming a wiper, pivoted adjacent the inner guide, the central higher portion of the wiper projecting into said recess, in the inner guide, and forming the wiping edge, the lower stepped portion of the wiper projecting over said guides, and forming together with the bed, a guide way for the sole to be operated upon, a vertically reciprocating presser mounted adjacent the wiper for pressing the material upon the sole after it has been folded down

upon the sole, means for actuating said wiper and presser, said actuating means being constructed and timed to complete the downward stroke of the presser upon the material as the wiper completes its forward stroke.

9. In a folding machine, the combination with the frame and bed, of a pair of independently movable spring pressed guides lying side by side, against the ends of which the work is adapted to be pressed, a wiper in the form of a disk, having a wiping edge, said wiper being pivoted adjacent the guides and overlapping said guides, a vertically reciprocating presser, and means for automatically operating said wiper and presser.

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

HENRY B. HARRISON.

Witnesses:
CHARLES LEWIS,
E. W. KELLY, Jr.