W. S. Milder.

Ruling Mach.

No. 6645. Patented Aug. 14. 1849.

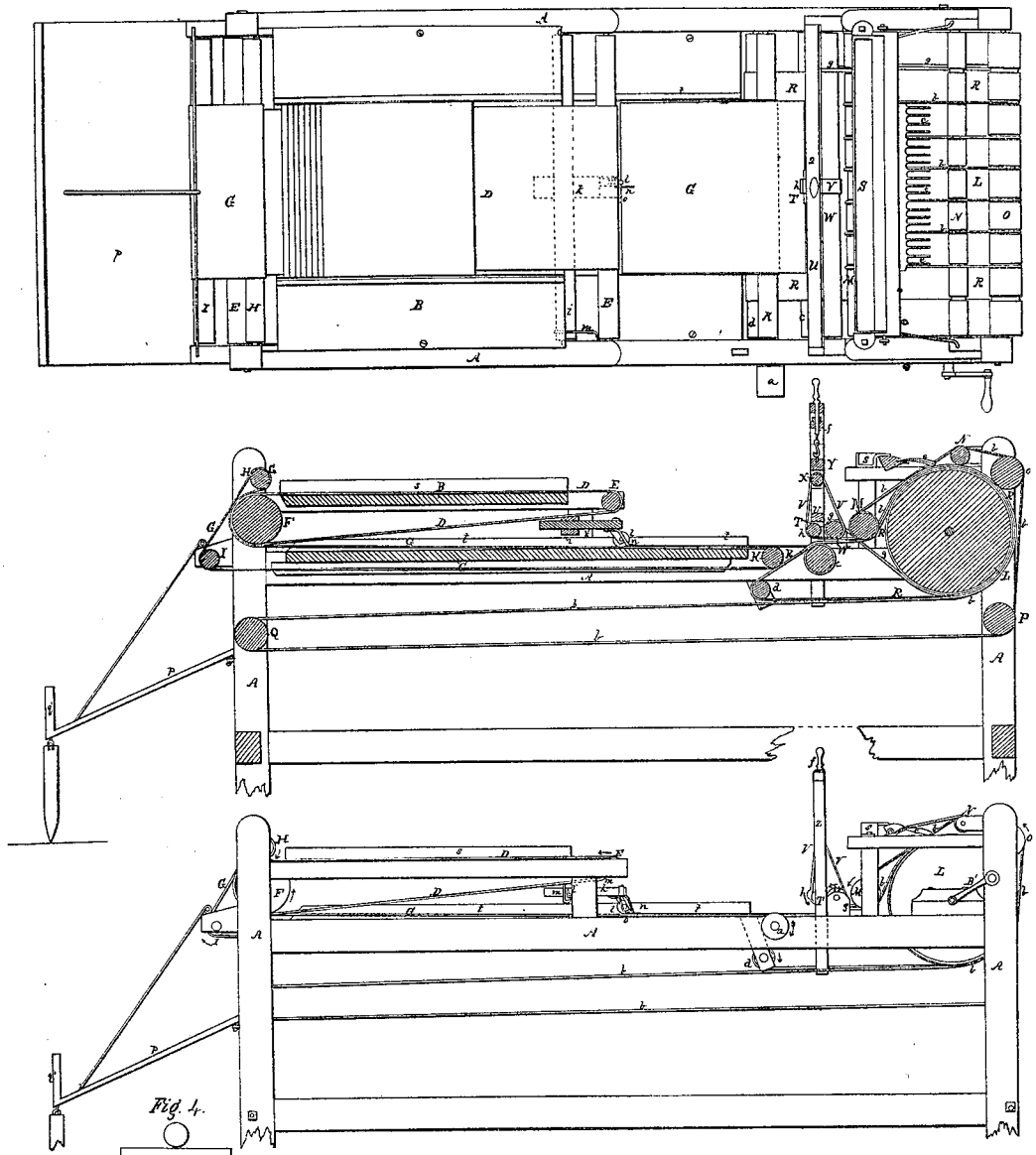
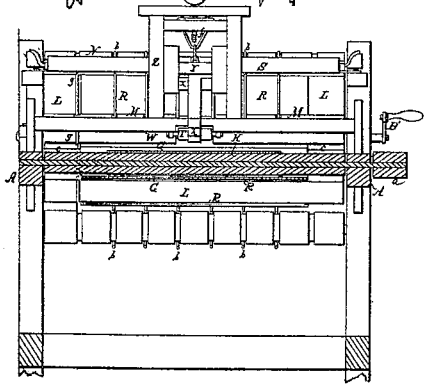


Fig. 1.



UNITED STATES PATENT OFFICE.

WM. S. WILDER, OF BOSTON, MASSACHUSETTS.

MACHINE FOR RULING PAPER.

Specification of Letters Patent No. 6,645, dated August 14, 1849.

To all whom it may concern:

Be it known that I, WILLIAM S. WILDER, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful or Improved Machine for Ruling Paper; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, and references thereof.

Of the said drawings Figure 1 denotes a top view of my improved machine. Fig. 2 is a front side elevation of it. Fig. 3 is a vertical, central, and longitudinal section of it. Fig. 4 is a vertical, central, and transverse section of it, the same being taken so as to represent the expansion endless belt and its supporting frame, to be hereinafter described.

The frame work which supports the operative parts of the machine is seen at A, and is constructed in any suitable manner. It sustains two boards or platforms B, and C, which are disposed horizontally and parallel to each other, and in other respects with regard to one another as seen in Figs. 1 and 3.

An endless band D, runs and rests on the top surface of the table or platform B, and also around two rollers or cylinders E, and F, arranged with respect to the platform B as seen in Fig. 3. The said endless belt or apron D, operates in connection with a second endless apron or belt G, which is disposed with regard to the apron D as seen in Fig. 3, and made to run partially around the roller F, and to encompass the inferior or lower platform C, and be supported by and run around three rollers, H, I, K, arranged as seen in Fig. 3. In its passage over the roller E, the endless apron G, is made to run in contact with that part of the apron D, which extends around the roller.

The roller K, at the front end of the platform C, has a small cylinder *a*, fixed on its shaft; the said cylinder being for the purpose of enabling the attendant of the machine to rotate the roller K, as required, which he can do by applying his hand to the cylinder and revolving it. In lieu of the said cylinder a simple crank might be used, but on some accounts I prefer the cylinder to the crank.

L, is the main ruling or bed cylinder. It is placed at one end of the machine and rotated by means of a crank B′, affixed to its shaft. The said cylinder has an endless apron R, extending around it, and several guide rollers M, *c*, *d*, Fig. 3. This apron operates in connection with a series of endless bands or tapes *b*, *b*, *b*, &c., which are extended around several guide rollers M, N, O, P, Q, disposed with respect to one another, the cylinder L, and the endless aprons D, and G, as seen in Fig. 3. The ink fountain is represented at *s*, and the series of ruling pens at *e*, *e*, *e*, &c., they being applied to the main ruling cylinder and made to operate substantially as in other ruling machines of the character of the one herein described.

T, Figs. 3, and 4, is a small stationary roller arranged directly over and parallel to the guide roller *c*, before mentioned; the said roller T, being supported by a horizontal cross bar U, which may be so affixed to the main frame A, as to be capable of being raised up or lowered down so as to carry the roller T, nearer to or farther from the roller *c*, as occasion may require. An endless belt V, is made to run around the roller T, and two rollers W, and X, arranged as seen in Figs. 3 and 1. This belt should be made of caoutchouc or some other proper elastic substance which will admit of extension and contraction in the direction of its length. The upper roller, viz, the roller X, on which it runs, is supported by a frame Y, which slides between the posts of a gallows frame Z, erected on the cross bar U, and has a screw *f*, *c*, &c., so applied to it and the frame Z, as to enable a person by turning the screw to either raise or lower it (the frame Y,) at pleasure. The roller W is put in revolution and so as to revolve the elastic endless belt, by means of a crossed endless band *g*, which runs around it and the main ruling cylinder L.

A projection or protuberance *h*, is made on the belt V, and operates as will be hereinafter described. A cross rocker shaft *i*, has an arm *k*, projecting from it, and supporting a small roller or wheel *l*, which is placed on or directly over the endless apron G, and in the position as seen in Figs. 1 and 2. The roller is pressed down toward the apron by means of a spring *m*, suitably applied to the cross rocker shaft *i*, and the main frame A. In connection with the roller or wheel *l*, a small spring or wire *n*, is made to project from the arm *k*, and to rest on the paper

when passing underneath it. Besides the above a small gage or thin piece of metal *o*, is made to extend down from the arm *k*, as seen in Fig. 2. At the rear end of the machine or that end of it at which the paper is discharged after being ruled, an inclined table or board *p*, is made to extend downward and outward from the roller Q as seen in Fig. 3. A guide ledge or strip *s*, is fastened to, and extends above the upper surface of the board or platform B. Another and similar ledge *t*, is also applied and fastened to the upper surface of the board *c*, and so as to be directly underneath and parallel with the ledge *s;* each of said ledges being made to extend from one end of its platform to the other end of it.

Having thus described the principal operative parts of my machine, I shall now proceed to explain the manner of ruling paper by it.

In the first place the sheets of paper to be ruled are spread out on the top surface of the endless apron D, and in such manner that while one end of each sheet shall be pressed close against the guide ledge *s*, that edge of it which is perpendicular thereto, and next adjacent to the cylinder or roller F, shall be a little or a short distance farther back from the said roller, than is the corresponding adjacent edge of the next sheet below; and so on throughout the pack or collection of sheets. This being effected the operative or attendant on the machine applies his hand to the cylinder *a*, and turns it in the direction denoted by the arrow in Fig. 2. This puts the endless aprons D, and G, in motion and causes the pile of sheets to pass between the said two endless aprons, and from the upper one down upon the lower one; the said sheets in the meantime being turned over or reversed in such manner, that the side of each sheet which was upward when on the belt D, is downward when on the belt G. Each sheet on the belt G, will be somewhat nearer the expansion belt V, than the sheet immediately preceding or below it. Consequently when the sheets are advanced toward the place of meeting of the projection *h*, (of the endless expansion belt V,) and the endless apron R, the upper sheet will be first seized by said projection and the apron R, and drawn in between and by them, and off the pile. The next upper sheet will be next seized and drawn in, and so on through the pile or collection. Each sheet while passing between the projection *h*, and the apron R, is presented between the series of endless tapes *b*, *b*, *b*, and the apron R, and is by the same drawn forward, carried under the ruling pens, and ruled by them, while it passes under them. Thence it is carried downward, and turned over or reversed, and thence moved bockward, and on the tapes and finally discharged over the roller *q*, and drops down upon the inclined table or board *p*, and is finally arrested by the upright ledge *q*, thereof. While each sheet is being drawn off the apron G, the workman advances the next sheet toward the belt V, and stops it when its rear edge reaches the gage *o*. As soon as the preceding sheet has been fully drawn off the apron G, the second or next sheet will be seized and drawn off.

The object of making the belt V, an expansion belt, is to enable us to so regulate its length, that is increase or diminish it, that the projection of it during each revolution may be brought around at the proper period of time, to seize or act on each sheet of paper. As the sheets of different reams vary somewhat in length, the necessity of this increase or diminution of the length of the belt, becomes manifest in order that the machine may be adapted for ruling the various kinds of paper found in the market. Besides the above my machine on discharging the sheets upon the table *p*, restores them all to their original position in the pack or quire, which is very important in order to have sameness of appearance of the edges of the pack.

What I claim as my invention is—

The expansion belt V, and projection *h*, in combination with the endless apron R, and the machinery for gaging and delivering the sheets of paper thereto substantially as specified; the said machinery being the endless aprons D, and G, and gage *o*.

In testimony whereof, I have hereto set my signature this 28th day of February, A. D. 1849.

WILLIAM S. WILDER.

Witnesses:
R. H. EDDY,
JOHN NOBLE.