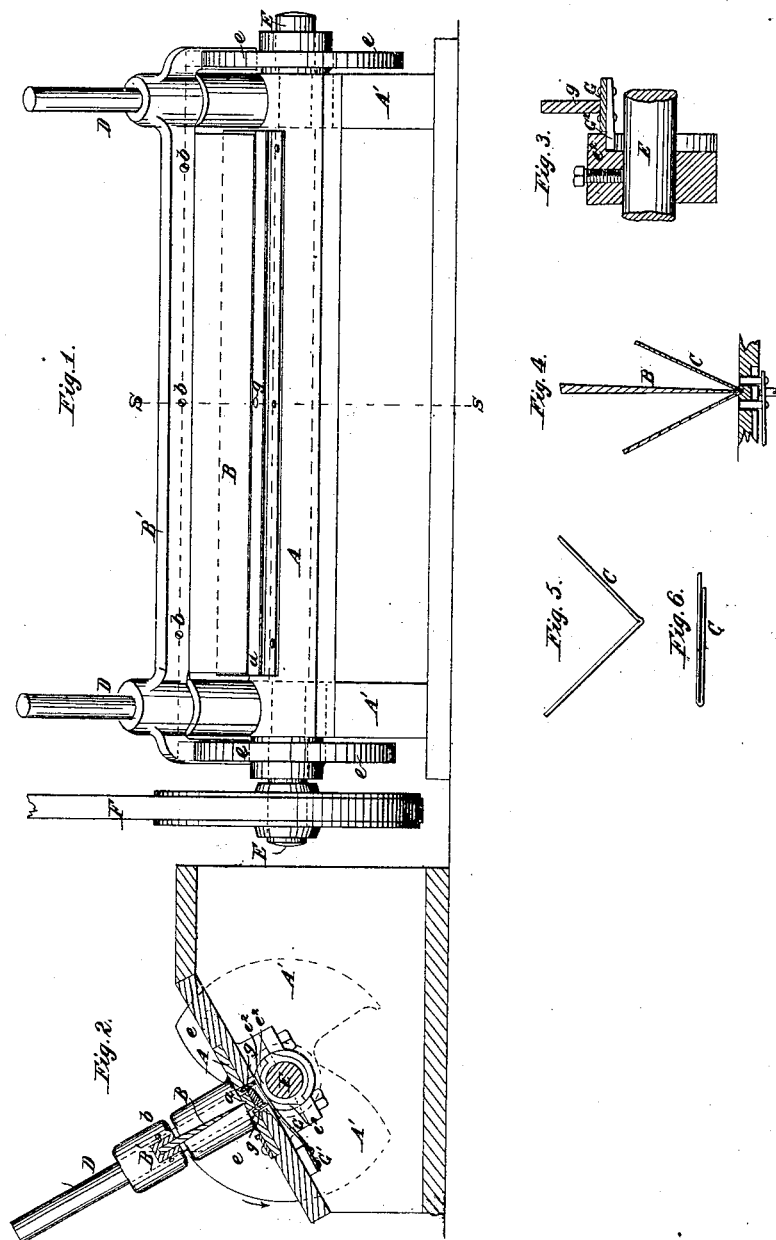


E. VOSSNACK.  
MACHINE FOR FOLDING PAPER COLLARS.

No. 50,426.

Patented Oct. 10, 1865.



Witnesses:  
Thomas D. Stiles  
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# UNITED STATES PATENT OFFICE.

EMIL VOSSNACK, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND G. A. GOLDSMITH & CO.

## IMPROVEMENT IN MACHINES FOR FOLDING PAPER COLLARS.

Specification forming part of Letters Patent No. 50,426, dated October 10, 1865.

*To all whom it may concern:*

Be it known that I, EMIL VOSSNACK, of the city and county of New York, in the State of New York, have invented certain new and useful Improvements in Machines for Folding Paper Collars and the like articles which are liable to break or crack in folding; and I do hereby declare that the following is a full and exact description thereof.

The accompanying drawings form a part of this specification.

Figure 1 is a front elevation of the machine. Fig. 2 is a cross-section on the line SS in Fig. 1. Fig. 3 is a longitudinal section, showing a small portion. Fig. 4 is cross-section of a portion, showing, also, a collar in the act of being folded. Fig. 5 is a corresponding section showing the collar as it is discharged from the machine; and Fig. 6 is a corresponding section showing the collar after it has been finally finished by a subsequent operation of passing through rollers.

Similar letters of reference indicate corresponding parts in all the figures.

The collars are supplied to the machine one by one, either by hand or otherwise, and the machine is operated by turning a shaft, either by a hand-crank or otherwise. Each collar is successively bent or partially folded so as to shape and smoothly bend or form the fold, and is then thrown off and allowed to fall into a suitable receptacle or be removed by hand. The operations may be performed very rapidly, and the bending is very uniform and reliable.

Paper collars require to be folded nearly or quite flat. The ordinary mode of folding, by a knife carrying them each between two surfaces or stops, is liable to produce a rough and broken edge by the rending of the material. Efforts have been recently made to fold by pressing the collars upon a block of rubber or the like yielding material, but the resistance of the rubber is not sufficient to properly harden and smooth the material of the collar under the great rending strain to which it is subject, and in a little time the rubber becomes deeply recessed, and the collar is liable to be broken before it begins to be supported by the rubber at the proper point.

My invention obviates these difficulties and enables me to fold with a high degree of smoothness on the edge with very great rapid-

ity and to continue the operation for any length of time required.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation by the aid of the drawings and of the letters of reference marked thereon.

A is the fixed bed of my machine, supported in an inclined position on the framing A', as represented, and provided with a slight stop or bar, A<sup>2</sup>, against which the lower edge of the collar may rest when in position, ready to be operated on. The bed A is grooved along the line where the collar is to be folded, and the groove is very nicely rounded and smoothed, as indicated by *a*. I make the bed of brass, by preference, but can make it of iron, steel, hard wood, or any material which will receive and maintain a uniform and smoothly rounded groove, and will be rigid under the severe impressions of the knife.

B is a knife of hardened steel adapted to form the inner side of the fold, and C is a collar of paper which it is desired to fold. The knife B is fixed by screws *b* to a frame, B', which is adapted to slide on guides D, extending upward from the framing A' of the machine. The frame B' extends beyond the guides D at each end, as indicated, and is acted on by the cams *ee* on the shaft E, which latter is rotated by the belt F from some convenient power, as will be easily understood from the drawings. The cams *ee* lift the knife B and hold it suspended a little time. They then allow it to drop upon the collar C, which has been meantime introduced. On striking the collar it forces it into the shallow and smoothly rounded groove *a*, and clearly and smoothly forms the bend, causing the collar to rise at each edge, as indicated in Fig. 4. On the knife again lifting, the collar thus treated is liberated. In order to insure its prompt disengagement from the smooth groove *a*, into which it has been so compressed, a clearer, G *g g*, is provided, which is also worked by the rotation of the shaft E, and rises with a sudden but gentle blow under the collar to strike it upward.

G is the main body of the spring, secured to the framing A' by a screw, G', as indicated. The striking-pins *g g* are fixed to the main body G, and strike through holes in the bed A,

as represented. The shaft E has a cam, *e*<sup>2</sup>, which at each half-revolution acts on the projection G<sup>2</sup> on the side of G, and, drawing down the spring G and its pins *g g*, holds them down while a collar is applied and bent on the bed A, and immediately after the knife B rises releases the spring G and allows it to strike a slight blow upward, thrusting its pins *g g* through the holes in A against the collar C and throwing it out of the groove *a*. The collar then slides down the bed A to be further folded, as usual, by being passed between rollers, (not represented,) while the pins *g g* are again pulled down, a new collar supplied by the feeder by hand or by machinery, and the entire operation repeated.

I can add springs, if necessary, in order to carry down the knife B and its attachments with sufficient speed and force; or I can increase the weight by thickening or adding parts to the frame B to any extent required.

It is not usually necessary for the attendant to thrust the fingers under the knife in properly feeding the machine or removing the collars; yet this will occasionally be done, and a want of skill or attention will sometimes cause the fingers to be caught under knife B. The edge of the latter is considerably rounded, and the effect of such contact is not nearly as severe where the knife simply falls freely as where it is drawn down by inflexible machinery, as in machines for the purpose heretofore used. I find, also, that the effect of a blow is much better in folding collars which vary much in thickness, because, when the depression of the knife is rigidly uniform, it acts too severely on the thick and too little on the thin collars. My machine, by its combination of the cams *e e* and the freely-falling knife B, acts pretty equally on all.

Some of the advantages due to certain features of my invention may be separately enumerated, as follows:

First, by reason of the fact that each collar is acted on between the edge of the knife B and the shallow and rounded groove *a* in the

rigid bed A in the manner shown, I am able to support it firmly, and to insure that the exterior of the fold is in contact with the groove before the collar is considerably bent, to use for my bed a hard and enduring material, like iron or steel, which will not materially change with long use, and to act on the collar with any amount of force required to perfectly compress the fibers on the outer side of the bend and adapt them to their new position.

Second, by reason of the fact that the knife B is operated by the cams *e e* so as to remain suspended a time at the full height, and then fall by gravity in lieu of being drawn down by the positive motion of the machine, I am able to secure a considerable time to introduce the collar properly in contact with the gage-bar A<sup>2</sup> to escape with less injury to the hands in case of an occasional too long delay in removing them from under the knife, and to operate on collars of as great difference in thicknesses as ordinarily occur in collar-making with great uniformity, without any adjustment of the machine.

Having now fully described my invention, I claim and desire to secure by Letters Patent as follows:

1. The employment, in a folding-machine, of the knife B and hard bed A with the shallow and rounded groove *a*, so combined as to form the fold in the material C and condense the material on the exterior of the fold against the hard bed, substantially in the manner and for the purposes herein set forth.

2. The combination of the freely-falling knife B with the elevating and holding cams *e e*, and with a grooved bed A *a* or its equivalent, adapted to compress and round the bend or fold in a paper collar or analogous weak material, all operating together substantially in the manner and for the purpose herein set forth.

EMIL VOSSNACK.

Witnesses:

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