(No Model.)

N. C. STILES.

COPYING APPARATUS.

No. 343,505. Patented June 8, 1886.

Fig. 1.

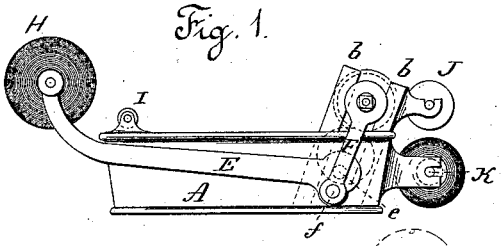


Fig. 2.

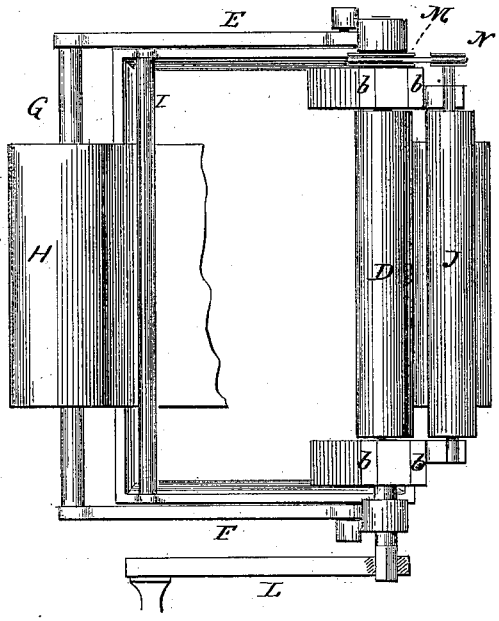


Fig. 3.

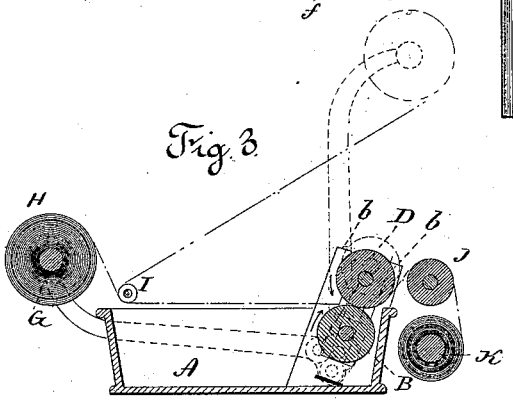


Fig. 4.

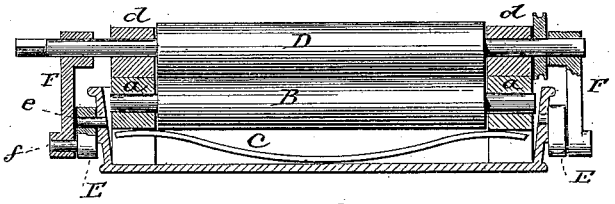
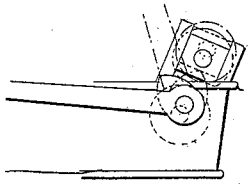


Fig. 5.



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UNITED STATES PATENT OFFICE.

NORMAN C. STILES, OF MIDDLETOWN, CONNECTICUT.

COPYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 343,505, dated June 8, 1886.

Application filed August 3, 1885. Serial No. 173,383. (No model.)

To all whom it may concern:

Be it known that I, NORMAN C. STILES, of Middletown, in the county of Middlesex and State of Connecticut, have invented a new Improvement in Copying Apparatus; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, an end view of the machine complete; Fig. 2, a top view of the same; Fig. 3, a transverse section; Fig. 4, a longitudinal section immediately in front of the rolls B D and looking toward the rolls; Fig. 5, a modification.

This invention relates to an apparatus for copying letters and other documents written with what is commonly called "copying-ink," the object being to simplify the process of copying; and the invention consists in the construction of the apparatus as hereinafter described, and more particularly recited in the claims.

A is a tank or reservoir adapted to hold water for copying, and is made of any convenient size and shape. In suitable bearings, *a a*, inside the tank a roll, B, is arranged. The bearings *a a* rest upon the respective ends of a spring, C, in the tank below the roll, the force of the spring being upward. The bearings *a* are adapted to move in guides *b b*, so that they may have a certain amount of nearly vertical movement. In the same guides, but above the bearings *a*, bearings *d* are arranged, carrying a similar roll, D, these rolls adapted to revolve in their respective bearings.

Upon the outside of the tank at each end a lever, E, is hung. Upon a pivot, *e*, on the hub of this lever is an eccentric stud, *f*, below the pivot when the lever is turned down, as seen in Fig. 1, and from the stud *f* links F connect with the ends of the shaft of the roll D, as seen in Fig. 4. When the lever is turned down, as seen in Fig. 1, the link holds the upper roll hard down upon the lower roll and compresses the spring C to some extent; but as the lever is turned upward to the position seen in broken lines, Fig. 3, the stud *f* swings upward and imparts vertical movement to the shaft and the roll D, separating it from the roll below, as indicated in Fig. 3. The two levers E E are connected at their extreme ends by a rod, G, so that the two levers will move together, and thereby act upon both ends of the roll at the same time.

On the shaft G a roll, H, of copying-paper is arranged so as to be conveniently drawn from as may be required in the operation of the press.

I is a guide-roll near the edge of the tank, opposite the principal rolls, B D, under which the paper will pass from the roll H between the rolls B D, as indicated in Fig. 3. Outside the roll D is a guide-roll, J, over which the paper passes to a shaft, K, where the paper is wound as it passes between the rolls B D. The shaft of the roll D has a crank, L, applied to it, by which it may be conveniently turned, and on the same shaft is a grooved pulley, M, and a similar grooved pulley, N, is arranged on the shaft K, with a band around the two, so that rotation imparted to the roll D will in like manner be imparted to the shaft K, so that paper drawn through between the rolls B D will pass over the roll J and be wound upon the shaft K, (the direction of revolution of the roll D is indicated by the arrow, Fig. 3,) and so as to draw the paper from the roll H, and the direction of revolution of the shaft K is to wind the paper so drawn from the roll H.

The rolls B D are best made from an elastic material, as rubber, or any suitable flexible material which may serve as pressure-rolls upon the paper passing between them.

The tank is filled with water, so that at least the lower portion of the roll B may be immersed and run therein, and so that the roll B, so revolving, will take up a certain amount of water upon its surface, and the surface so moistened will moisten the paper passing between the rolls B D drawn from the roll H.

In operation the copying-paper, arranged as described, and the roll B, adapted to moisten the copying-paper, the rolls B D held in close bearing-contact, the letter or document to be copied is placed upon the copying-paper in rear of the roll D, the written surface on the copying-paper, and the rolls B D revolving will draw the copying-paper and the docu-

ment to be copied between them, the copying-paper being moistened as it enters between the rolls. The document and the copying-paper will be hard pressed together, so that the copying-paper will take its impression from the writing on the document, and thence the copying-paper, together with the document, will pass out over the roll D, delivering the document, while the paper copied upon will be wound upon the shaft K. Thus successive copies may be made and wound upon the roll K. Each document may be numbered, so as to leave the same number at the place in the paper where it is copied, and so that an index may be made indicating the position of the copy, as in a book, the paper to be unrolled when it is desired to examine the copy. One roll of paper having been consumed, a new roll is introduced, and the copying proceeds as before.

This apparatus is specially adapted to copying telegraphic messages, but is applicable to general copying purposes.

Instead of copying upon a continuous strip, the copying-paper may be introduced in sheets to pass between the rolls, as described, and the work be accomplished a single sheet at a time.

Instead of making the roll H the paper-roll, the material may be cloth or any suitable fabric which will form an apron, and be drawn from the roll H in the same manner as the paper, the apron becoming dampened in its passage, as described for the paper. In that case the copying-paper is laid upon the apron back of the roll D and the document to be copied upon the copying-paper, so that the document and copying-paper will pass with the apron between the rolls B D. Fig. 3 therefore illustrates this modification, as well as the arrangement first described.

When not required for copying, it is advisable to turn the levers E E upward to separate the rolls, that they may be relieved from the pressure one upon the other, or for the introduction of the paper or apron such separation of the rolls is advisable.

While I prefer the link arrangment between the lever and the upper roll as a means for separating the two rolls, the hub of the levers may be in the form of a cam working underneath the bearing of the upper roll, as seen in Fig. 5, and accomplish the same result.

I claim—

1. The combination of the tank A, rolls B D, one arranged to receive moisture from the tank, and one substantially over the other, the bearings of the upper roll adapted to move upward and downward to separate the rolls or bring them together, and levers E E, hung upon pivots below the upper roll, the hubs of the levers constructed to engage the bearings of the upper roll, substantially as described, and whereby by the turning of the said levers the said rolls may be separated or brought together, according to the direction in which the levers are turned.

2. The combination of the tank A, the rolls B D, hung in independent bearings, said bearings arranged in guides to slide up and down, a spring, C, beneath the bearings of the lower roll, said lower roll adapted to receive moisture from the tank, and levers E E, hung upon pivots below the upper roll, the said levers constructed to engage the upper roll, substantially as described, and whereby by the turning of said levers the said rolls may be separated or brought together, according to the direction in which the levers are turned.

3. The combination of the tank A, the two rolls B D, the shaft K, outside the tank and in connection with the driven roll, whereby the rotation imparted to the driven roll will be imparted to the said shaft, levers E E, hung to said tank below the upper roll, D, with connection between said levers and upper roll eccentric to the pivots on which the levers are hung, and so that by the turning of the levers the said upper roll will be moved toward or from the lower roll, according to the direction in which the levers are turned, and the shaft G, adapted to support a strip of material to be drawn therefrom by the rolls B D, and so that the strip so drawn may be wound upon said shaft K, substantially as described.

4. The combination of the tank A, rolls B D, levers E E, the said levers arranged in connection with the bearings of said rolls, whereby under the turning of the said levers the said rolls may be separated or brought together, according to the direction of movement of said levers, the shaft G, connecting said levers, guide-rolls I and J, and shaft K, connected with one of the rolls D B and so as to receive rotation therefrom, substantially as described.

NORMAN C. STILES.

Witnesses:
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