

No. 628,885.

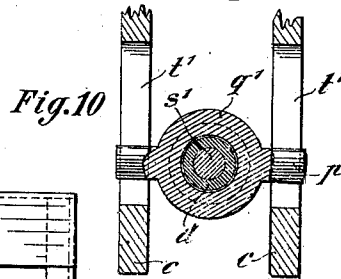
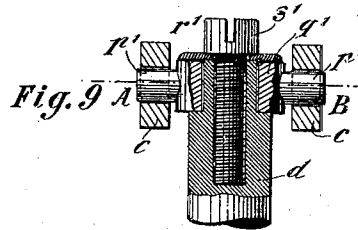
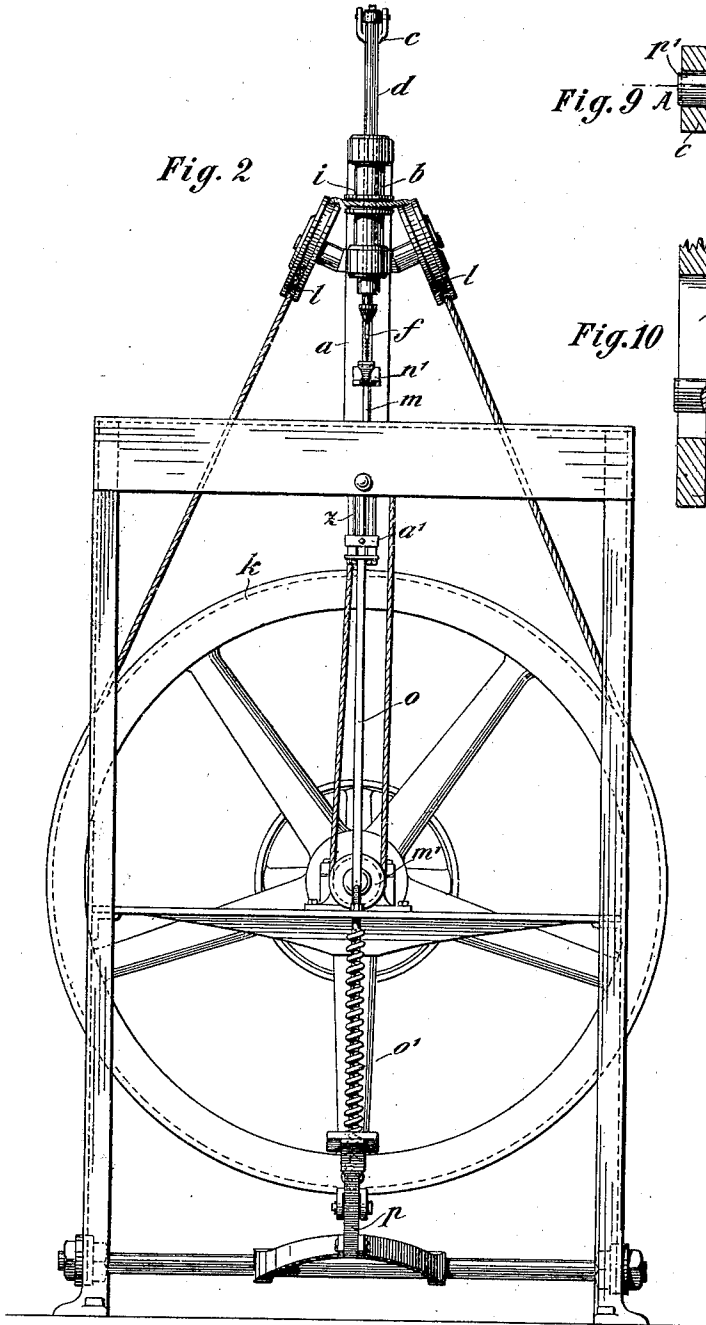
Patented July 11, 1899.

G. A. W. EHRHARDT.
MACHINE FOR THREADING PILES OF PAPER.

(No Model.)

(Application filed July 25, 1898.)

4 Sheets—Sheet 3.



Witnesses

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Fig. 3

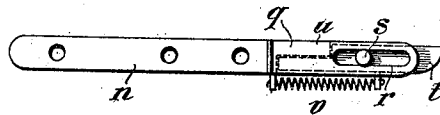


Fig. 4

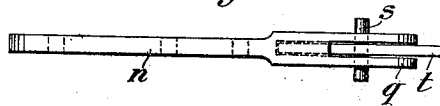


Fig. 5

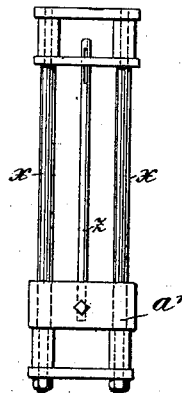


Fig. 6

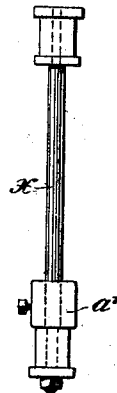


Fig. 7

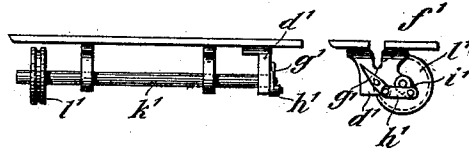
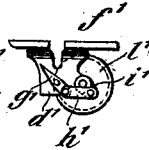


Fig. 8



Witnesses

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UNITED STATES PATENT OFFICE.

GEORG AUGUST WILHELM EHRHARDT, OF NEUMÜNSTER, GERMANY.

MACHINE FOR THREADING PILES OF PAPER.

SPECIFICATION forming part of Letters Patent No. 628,885, dated July 11, 1899.

Application filed July 26, 1898. Serial No. 686,860. (No model.)

To all whom it may concern:

Be it known that I, GEORG AUGUST WILHELM EHRHARDT, a subject of the King of Prussia, Emperor of Germany, residing at Neumünster, Holstein, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Drilling and Threading Machines for Piles of Paper Bags and the Like, (for which I have applied for patents in Austria, dated June 18, 1898; in Hungary, dated June 18, 1898; in France, dated June 22, 1898; in Belgium, dated June 22, 1898; in Switzerland, dated June 17, 1898; in Germany, dated September 24, 1897; in Sweden, dated June 17, 1898; in Norway, dated June 21, 1898, and in Denmark, dated June 22, 1898,) of which the following is a specification.

Paper sheets, paper bags, sacks, and the like are threaded and hung up in a convenient place for the purpose of having them at hand and of enabling them being readily taken for use. This threading is effected almost wholly by hand, and is therefore an extremely tedious operation, and in the case of strong paper it is also very tiring. Recently it has been tried to effect these operations by means of machines, but without success, because on the one hand the needle when forced through the paper is readily bent and then goes astray or crooked, or breaks off completely, while on the other hand the holes are extremely liable to get torn by the forcing through of the needle.

Now this invention relates to a machine for effecting the above objects while obviating all the above drawbacks in every respect.

This machine is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation with the frame partly omitted; and Fig. 1^a is a view similar to Fig. 1, showing the relative position of the parts when the treadle is depressed and the needle-driver in engagement with the needle-block. Fig. 2 is a front elevation. Figs. 3 to 10 illustrate details of the machine on a larger scale. Figs. 3 and 4 illustrate the needle-driver in side elevation and in plan. Figs. 5 and 6 illustrate the needle-holder with its guide in two elevations, taken at right angles to each other. Figs. 7 and 8 illustrate the apparatus for cutting the

threads after they are drawn through. Fig. 9 illustrates the connection of the drilling-spindle with its operating-lever in vertical section. Fig. 10 is a section on the line A B of Fig. 9.

The machine consists, essentially, of the device for boring a hole for the thread to be drawn through, of the device for drawing the thread through, and of the device for cutting the thread. The first device consists of a sleeve *b*, which is pivotally mounted in the frame *a* and which serves to receive the drill-spindle *d*, that is fixed to the lever *c*, with the drill *f* fixed therein. The spindle *d* is capable, by reason of being coupled with the sleeve by means of the pin *g* and slot *h*, of being rotated by the cord-pulley *i* by means of a cord passing over the pulley *k* and guide-pulleys *l*. The spindle is also capable of being raised and lowered by the operation of the lever *c*. For this purpose the drill-spindle is turned down or stepped at its upper end and a ring *q*, provided with pins *p*, is slipped over it. This ring is prevented from falling down by means of a plate *r* and screws *s*. The pins of this ring engage, as shown in Fig. 10, in the slots *t* of the fork of the lever *c*, from which a rod *m* leads to a one-armed lever *n*, which is fixed below the frame table-plate and which is connected by means of a rod *o* with the treadle-lever *p*. The lever *n* serves as needle-driver, and is constructed for this reason at its front free end with a fork *q*, in which, as shown in Figs. 3 and 4, there are provided slot-holes *r*, through which pass the pins *s* of a tongue-piece *t*, which engages at its rear end with a nose under the shoulder *u* of the fork and which is constantly pulled into the fork by means of a spiral spring *y*. The pins *s* of the tongue-piece *t* project from the slots of the fork and engage, as shown in Fig. 1, in slots in a guide-piece *w*. Furthermore, guide-rods *x* (shown in Figs. 5 and 6) are fixed below the table-plate, and upon these guide-rods there is movably mounted a block *a*, that holds the needle *z*. This block is either made purposely so heavy that, notwithstanding any frictional resistances which may be met by the needle and the inserted thread in the pile of paper, the said block will draw down the needle with certainty or the said block may be weighted with a separate weight or may

be pressed down by means of spiral springs arranged on the guide-rods over said block. The guide *w* and the guide-rods *x* are situated, not parallel to each other, but converging, whereby the tongue *t* of the lever *n* is enabled to take under the needle-block when the lever is drawn down, while it is enabled to release the same when the lever is in a horizontal position. Approximately on the same level as the lever *n* there is arranged a gripper-lever *b'*, whose nose is constantly pressed into the path of the needle-block by means of a spring *c'*. Directly under the table-plate at the end of a slot, Fig. 8, which extends from the working hole in the table-plate to the front edge of the table there is fastened an angle-piece *d'*, which is formed with a notch or recess *f'*, the edges of which are sharpened after the manner of scissors. In front of these edges there works a knife *g'*, which is caused to oscillate by the machine by means of the crank-rod *h'*, crank *i'*, shaft *k'*, and the cord-pulleys *l'* and *m'*.

The mode of operation of the machine is as follows: When a thread has been drawn through the eye situated in the upper end of the needle, the pile of paper to be threaded is pushed under the raised presser-foot *n'*. It is then let go, whereupon it is caused by its tension-spring to press down the pile. Then by throwing the machine into gear the drill-spindle is caused to rotate and the treadle-lever *p* is moved down, whereby the drill-spindle, with its drill, is also moved down. In this manner the drill drills a hole through the pile of paper; but at the same time the needle-driver *n* has also been moved down and its tongue-piece *t* in moving upward has passed the needle-block *a'* and has moved under the same. If, now, the treadle-lever be released, the spring *o'* will draw it up again, while at the same time the lever *c* and the lever *n* rise, whereby the drill and the needle-block are also raised. The drill moves out of the pile of paper, while the needle-block pushes the needle *z*, contained in it, together with its thread, through the drill-hole, so that the needle projects about thirty millimeters out of the pile. At the end of the stroke of *n* the tongue *t* leaves the block through the mutually-inclined positions of *w* and *x*, and the block descends, together with the needle, until it comes within the reach of the nose of the lever *b'*. In this manner there has been formed at the projecting part of the needle a loop of string or thread, which is seized by the attendant of the machine and is held fast by him. Then on drawing back the gripping-lever the block falls into its original position, and thus draws the needle with it, while the eye of the needle slides along the thread, which is being held fast. The pile of paper is now, together with the thread that

is held fast, drawn out from under the raised presser-foot, while the thread slides along in the above-mentioned slot in the table-plate and is cut when it arrives at the knife *g'*. The pile is now ready to be tied up and the threading of the second pile can now begin.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a machine for threading paper sheets arranged in piles, the combination with a drill and its longitudinally-movable spindle, of a lever to move said drill and spindle, a needle to carry the thread placed and arranged in guides on the opposite side of the paper pile and in the same line with the drill, a needle-driver, a lever connected to the drill-lever and on which said driver is movable, and a guide to carry the needle-driver under a block in which the needle is held and to withdraw it at a proper point on the upward movement of the needle, substantially as described.

2. The combination with a drill and a longitudinally-movable drill-spindle, of a lever to move the same, a needle arranged in guides on the opposite side of the paper pile, a needle-driver, a lever connected to the drill-lever to carry the needle-driver in guides which converge toward the line of movement of the needle, and a spring-pressed needle-gripper to hold the needle after it has passed through the paper, substantially as described.

3. The combination with a drill and a longitudinally-movable drill-spindle, a lever to move said drill, a needle placed in guides in line with said drill but on the opposite side of the pile of paper, a lever connected to the drill-lever, a needle-driver having pins lying in slots in the arms of a fork on the end of said lever, a spring connecting the driver to said lever, a guide for said pins converging toward the line of movement of the needle, a gripper to hold the needle after passing through the paper, and a cutter to automatically sever the thread, substantially as described.

4. The combination with a needle movable in guides upon the lower side of a table supporting a pile of paper, of a needle-driver, a lever on which said driver is movable, a guide to carry said driver into engagement with a block carrying the needle, a spring-actuated gripper to arrest the return movement of said needle, and a cutter consisting of a fixed blade on the lower side of the table having a notch in line with a thread-slot in the table of, and a reciprocating blade driven by the machine, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

GEORG AUGUST WILHELM EHRHARDT.

Witnesses:

HERM. MÜHL,

GEROL L. MEYER.