(No Model.)

2 Sheets—Sheet 1.

J. H. SMITH.

CLOTH SHEARING MACHINE.

No. 265,882. Patented Oct. 10, 1882.

Fig. 2.

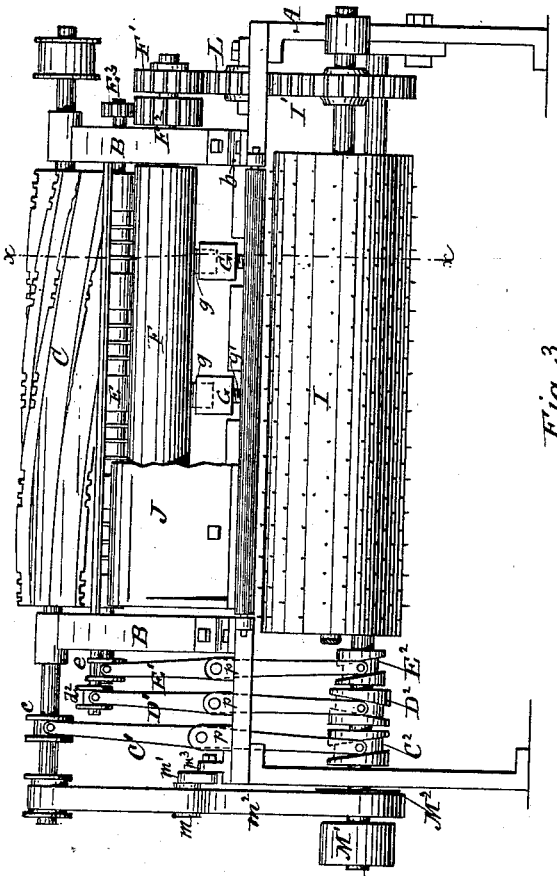


Fig. 3.

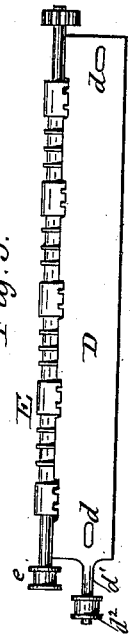


Fig. 4.

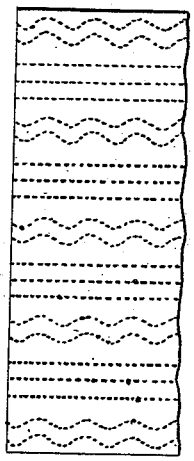
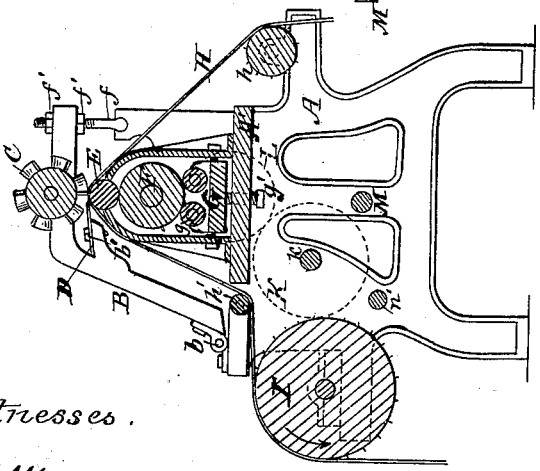


Fig. 1.



Witnesses.

W. B. Masson

C. C. Shepherd

Inventor

J. Harper Smith

by E. E. Masson

atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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CLOTH SHEARING MACHINE.

No. 265,882. Patented Oct. 10, 1882.

Fig. 6.

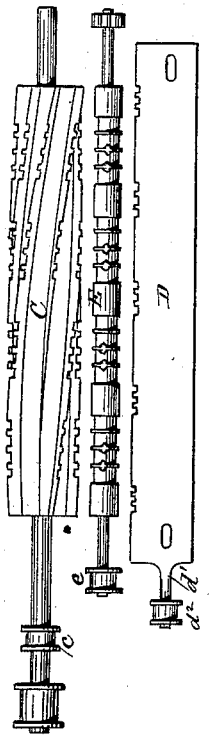


Fig. 7.

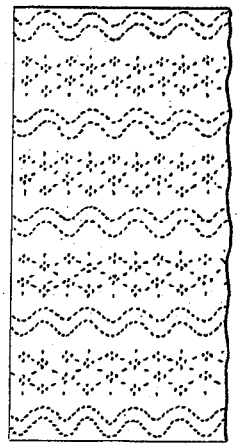
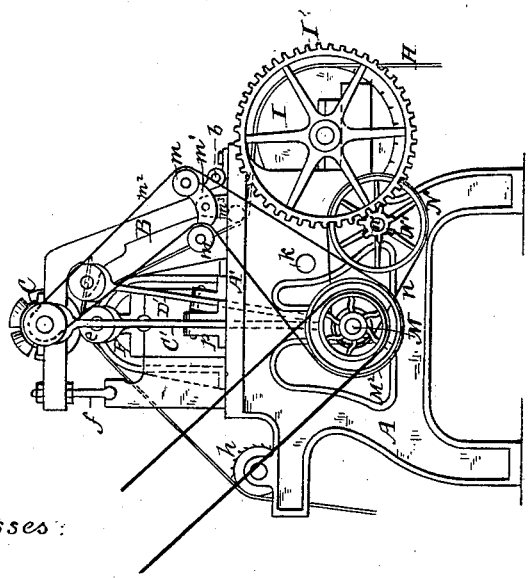


Fig. 5.



Witnesses:
W. B. Masson
C. C. Shepherd

Inventor
J. Harper Smith
by E. E. Masson
atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

J. HARPER SMITH, OF RARITAN, NEW JERSEY.

CLOTH-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 265,882, dated October 10, 1882.

Application filed March 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, J. HARPER SMITH, a citizen of the United States, residing at Raritan, in the county of Somerset and State of New Jersey, have invented certain new and useful Improvements in Cloth-Shearing Machines, of which the following is a specification.

This invention relates to that class of machines for cutting figures or designs upon cloth in which a relief-pattern upon a revolving cloth-supporting roller projects the surface of the cloth to meet the cutters. Its object is to produce upon the cloth, with one set of similarly-notched blades and a stationary or a longitudinally-reciprocating pattern-roll, a large number of clearly-cut, accurate, and uniform designs by projecting into the path of a notched ledger or notched revolving cutters only a surface of the cloth corresponding to the pattern projecting from the surface of the pattern-roll. This object is accomplished by the combination of a notched ledger-blade with the pattern-roller, or by the combination of a notched revolving cutter with the pattern-roller, or by the combination of a notched ledger-blade, a notched revolving cutter, and a pattern-roll. A brief mention of the possibility of using some of the above-stated combinations in cutting designs was made in the patent granted to me November 22, 1881; but the same were not claimed therein.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a longitudinal vertical section of the machine, taken on line *x x* of Fig. 2. Fig. 2 is a rear view of the same with some of the parts in section. Fig. 3 is a top view of one of the simplest forms of pattern-roll and a notched ledger-blade detached from the machine. Fig. 4 represents a sample of cloth having a design cut by the machine carrying the pattern-roll and either a reciprocating notched ledger-blade, as shown in Fig. 3, or a reciprocating notched revolving cutter, as in Fig. 2. Fig. 5 is a side view of the machine, showing the arrangement of gear-wheels, pulleys, belts, and operating-levers. Fig. 6 represents in relative position, but detached from the machine, the combination of a notched revolving cutter, a notched ledger-blade, and a pattern-roll, each of these parts being provided with means to receive a longitudinal reciprocating motion. Fig. 7 represents a sample of cloth having a design cut with the elements as combined in Fig. 6.

Heretofore the following elements have been combined in different cloth-shearing machines, viz: A notched revolving and reciprocating cutter, a stationary ledger-blade, plain or notched, and a cloth-rest having an acute edge, a notched cloth-rest having an acute edge, with a plain or notched revolving cutter, and a plain revolving cutter with a pattern-roll; but these combinations differ from mine, as well as their capabilities to produce a very large number of different designs with the same cutting-blades.

My invention will first be described in connection with the drawings and then pointed out in the claims.

In the drawings, A represents the frame of the machine. B represents an adjustable frame hinged at *b* to the main part of the frame, said frame B carrying the revolving cutter C and the ledger-blade D.

E represents the pattern-roll. It is supported along its length by the roll F, and the latter is sustained at intervening points upon small rollers *g*, journaled in adjustable boxes G, supported by screws *g'*, projecting from the platform A' of the main frame.

The cloth to be operated upon passes first upon the roll *h*, over the pattern-roll E, under a guide-roll, *h'*, to the cloth-drawing roller I. The latter having upon its surface a large number of fine points to engage with the cloth, it is positively connected with the pattern-roll E by means of gear-wheels I' K L F' F^2 E^3. (Shown by full lines in Fig. 2, dotted circles in Fig. 1, and fully described in my patent above mentioned.) The rolls E and F are partly inclosed in a casing, J. The forward end of the frame B is adjustably supported and connected with the frame A by means of bolts *f*, provided with jam-nuts *f'*, placed upon said bolts above and under the horizontal portion of the frame B. The revolving cutter C is mounted in the frame B in such a manner that it can be reciprocated longitudinally in its bearings. The ledger-blade D rests upon brackets forming a part of the frame B, and is also capable of longitudinally-reciprocating movement, being retained on said brackets by means of screws *b'*, passing

through slots d, made adjoining each end of the ledger-blade, the latter being provided with a stem, d', at one end, and this stem with the grooved collar d^2 to receive a forked lever, D', to reciprocate it. The shaft of the revolving cutter C is also provided with a grooved collar, c, to receive a similar reciprocating lever, C'. The pattern-roll E is supported in bearings secured to the frame A, and is also capable of a longitudinally-reciprocating motion, while its gear E^3 remains meshing with the gear F^2. To give to the pattern-roll this reciprocating motion one end of its shaft is provided with the grooved collar e to receive one end of the operating forked lever E'. The levers C' D' E' are oscillated by means of grooved cams C^2 D^2 E^2, placed upon the shaft M of the machine.

Power is applied to machine by means of a belt passing over a pulley, M', upon the shaft M. This shaft transmits motion by means of a belt, n, and a pulley, N, to a pinion, N', upon the shaft n', and this pinion gives motion to the gear-wheel I^2, mounted upon the shaft of the cloth-drawing roll I. The shaft M also carries the pulley M^2 to rotate the revolving cutter by means of a belt, m^2, the latter passing over guide-rolls m, mounted upon the ends of arms m', adjustably secured to a bracket, m^3, by which means tension upon the belt m^2 can be regulated. The levers C' D' E' are pivoted about the middle of their length in bearings p, secured to the frame of the machine. Although the cams operating these levers are shown as mounted on the same shaft, some of them may be mounted upon the shaft k, and thus be rotated at a different speed from those operated by shaft M. The design produced upon the cloth may thus be modified. The design shown in Fig. 4 can be produced by reciprocating either the revolving cutter or the ledger-blade while the pattern-roll is simply revolving. The pattern shown in Fig. 7 is produced by reciprocating the revolving cutter and the ledger-blade in one direction while the pattern-roll is reciprocated in the opposite direction, the series of small dots or small diamonds shown in Fig. 7 being made by the narrow cutting-edges of the notched portion of the revolving cutter coming for a brief space of time in contact with the portion of the cloth raised by the narrow pattern-rings projecting from the surface of the pattern-roll. Thus a great number of different designs can be produced by reciprocating either the revolving cutter or the ledger-blade with the pattern-roll, or the revolving cutter, the pattern-roll, and the ledger-blade, and a still greater number of different patterns can be produced by changing the time or position of one or more of the cams C^2 D^2 E^2, operating the parts by means of their oscillating levers.

Having now fully described my invention, I claim—

1. The combination of a ledger-blade, a notched revolving cutter, and a pattern-roll directly under said revolving cutter, and adapted to elevate portions of a cloth-surface against said notched revolving cutter, substantially as and for the purpose described.

2. The combination of a notched ledger-blade, a revolving cutter, and a pattern-roll adapted to elevate portions of a cloth-surface against the revolving cutter, substantially as and for the purpose described.

3. The combination of a notched ledger-blade, a notched revolving cutter, and a pattern-roll adapted to elevate portions of a cloth-surface against the revolving cutter, substantially as and for the purposes described.

4. The combination of a reciprocated ledger-blade, a revolving cutter, and a pattern-roll, with mechanism for operating the pattern-roll, substantially as and for the purpose described.

5. The combination of a ledger-blade, a revolving cutter, and a reciprocated pattern-roll, with suitable mechanism for operating the pattern-roll, substantially as and for the purposes described.

6. The combination of a reciprocated ledger-blade, a revolving cutter, and a reciprocated pattern-roll, with suitable mechanism for operating the pattern-roll, substantially as and for the purpose described.

7. The combination of a reciprocated ledger-blade, a reciprocated revolving cutter, and a reciprocated pattern-roll, with suitable mechanism for operating the pattern-roll, substantially as and for the purposes set forth.

J. HARPER SMITH.

Witnesses:
ADOLPH MACK,
HENRY STRYKER.