

(No Model.)

B. KARFIOL.

DEVICE FOR CUTTING AND EMBOSSED FABRICS.

No. 547,438.

Patented Oct. 8, 1895.

Fig. 1.

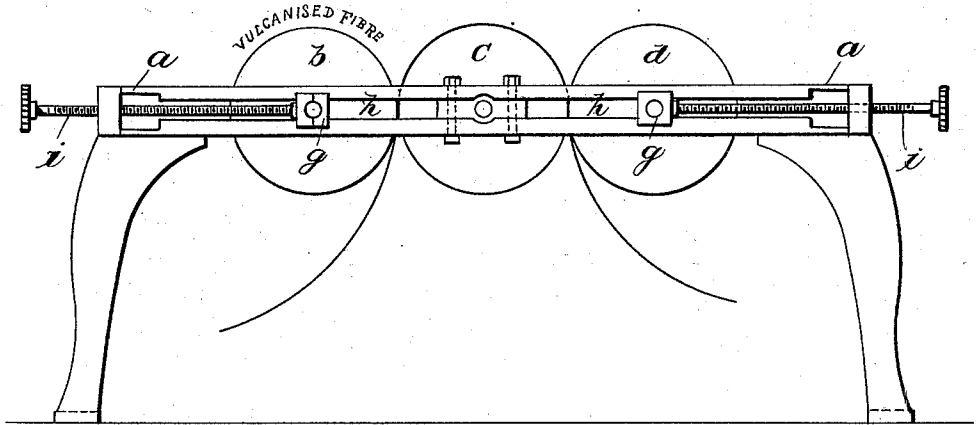


Fig. 2.

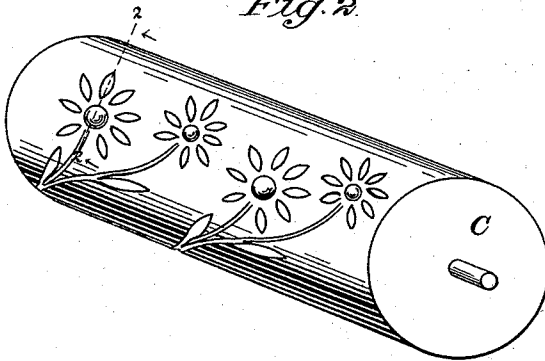
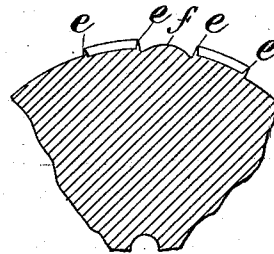


Fig. 3.



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DEVICE FOR CUTTING AND EMBOSSING FABRICS.

SPECIFICATION forming part of Letters Patent No. 547,438, dated October 8, 1895.

Application filed February 12, 1894. Serial No. 499,846. (No model.)

To all whom it may concern:

Be it known that I, BENZION KARFIOL, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Devices for Cutting and Embossing Paper, of which the following is a specification.

My invention relates to that class of apparatus used in embossing and cutting paper or other equivalent materials by means of dies prepared for that purpose, usually in the form of a design, such dies being provided with surfaces according to the character of the design, adapted to cut paper or emboss the same; and my invention relates directly to an improved cutting-bed to co-operate with the cutting-surfaces of such dies, and also to an improved matrix to co-operate with the embossing portion of the dies. Heretofore it has been usual to employ in such machines a cutting-bed made of lead or other soft metal. Leather and other kindred materials have also been employed for the same purposes; but it has been my experience in using these materials as a cutting-bed or for the purpose of providing a matrix for the embossing-die that their use is fraught with numerous objections, which make the operation of cutting and embossing expensive, and the work produced is oftentimes imperfect. With a cutting-bed made of lead it is necessary to constantly renew the surface thereof by planing or rolling or by the use of some other device that will restore the surface of the bed to a smooth condition after the cutting-surfaces of the die have engaged the same, and after a limited time the bed needs to be replaced, as the constant planing, rolling, or other smoothing of the surface gradually destroys the bed. With the use of a leather cutting-bed the leather rapidly deteriorates under the action of the cutting-surfaces of the die and must be replaced to perform efficient work. I have also used other materials as a cutting-bed, (which are too numerous to be set forth here,) such as paste-board cemented together, with a like result—that is to say, the cutting-bed needed to be constantly renewed to perform efficient work.

What I have said regarding a cutting-bed I have also found to be true with reference to the use of similar materials to form a matrix for the embossing portions of the die. The deterioration is not so rapid in this case; but it is inevitable, the elevated portions of the matrix chipping or breaking off under the pressure incident to the operation of embossing.

It is my purpose by my present invention to overcome these difficulties and to provide a cutting base or bed which will effectually co-operate with the cutting-surfaces of the die to perform the cutting without material injury or deterioration either to the cutting-surfaces or the bed, and which will require no planing, rolling, or other restoring device to renew its surface, and which will have the qualities of durability and cheapness of manufacture, and also to provide a similar bed or base which will have the quality of taking an impression from a die under pressure and forming a matrix for the embossing portions of the same, which matrix will have the quality of durability and cheapness of manufacture.

For the purpose of illustrating my invention I have shown in the accompanying drawings a form of press in which a die made in the form of a roller may be employed in combination with a cutting-bed and matrix-roller. My invention may, however, be employed with any form of press in which a chisel-edge is caused to co-operate with a cutting-bed or a die with a matrix. The form of press that I prefer to use I have described in my application for Letters Patent intended to be filed herewith.

Like letters refer to like parts throughout the drawings.

Figure 1 is a side elevation of the press. Fig. 2 is a perspective view of a die cut into the die-roller. Fig. 3 is a sectional view of the die.

Letter *a* is a frame carrying the three rollers *b c d*. The roller *c* is journaled in said frame *a* and carries on its periphery a die. This die is usually of metal, and it is engraved according to a design to present cutting-surfaces where it is desired to cut the paper, and concave or convex surfaces where it is de-

sired to emboss the paper. In Fig. 2 I have shown a perspective view of the die with a design cut therein. In this design the leaves are intended to be cut out and the center of the flower embossed. The arrangement may be of course varied at will. In Fig. 3 I show a section of this die taken on the line 2 2. It will be there observed that I make the cutting-edges of the die a degree elevated above the embossing portion thereof. This is done in order that the cutting action may be performed first as will be hereinafter described. The cutting-edges referred to are indicated as *e* and the embossing portions as *f*. The rollers *b* and *d* are journaled in movable bearings *g* and *g*, which move in ways *h* and *h*, provided for the same in the frame *a*, allowing the rollers *b* and *d* to be moved toward or away from contact with the roller *c*. This movement is controlled by the pressure-screws *i* and *i*, which are secured to said movable bearings *g* and *g*.

The roller *b*, which is known as the "cutting-roller" or "cutting-bed" is provided with a smooth face or periphery to co-operate with the cutting-surfaces of the die, and the roller *d* is prepared on its periphery as a matrix for the die. A convenient way of doing this is by bringing it in contact with the die under heavy pressure and repeatedly revolving the die and roller in such contact and under pressure until the irregularities of the die are impressed into the surface of the roller. I refer to this roller as the "matrix" or "matrix-roller."

The operation of cutting and embossing paper with machines of this type is that of revolving the die-roller and causing the cutting and embossing rollers to bear upon the same and passing the paper first between the cutting-rollers *b* and the die *c*, by which the cutting action is performed, and thence between the matrix-roller *d* and the die *c*, by which the embossing action is performed. As heretofore recited, the chisel-edges of the die, being a degree elevated above the embossing portion thereof, come in contact with the smooth surface of the roller *b* and cut the paper, and when the die engages the matrix the cutting-edges pass into the indentures corresponding with the same in the matrix. The paper having been previously cut allows the chisel-edges to pass through the same without hindrance and the embossing is performed as stated.

As heretofore recited, my invention lies in the employment of a material in the manufacture of these rollers which co-operate with the die, which material is more efficient in its operation and less expensive than anything, so far as I am aware, which has yet been employed for this purpose.

The material to which I refer may be described as follows: a chemically-treated and compressed paper or vegetable fiber, such as is sold under the various names of "vulcan-

ized fiber," "kartavert," "fiberoid," "laminar fiber," "leatheroid," "Delaware hard fiber," "indurated paper," &c. I may make the rollers of this material in solid form or I may prepare the same from sheets of the material cut into the form of washers and run upon a shaft compressed together. The chemically-treated and compressed fiber such as enumerated and described above all possesses to a greater or less degree the peculiar properties which make them useful for beds used in cutting and embossing machines, and when in my claims I specify "vulcanized fiber" I desire to be understood as including those substances named above as equivalent substances. This material and the processes by which it is manufactured is the result of recent discovery and has been the subject of numerous patents. It has been used principally as a material for electrical insulation. I have discovered that it has other qualities which make it particularly adaptable to use as a cutting bed or matrix. The toughness and unyielding character of the material presents a resistance to the knife-edges that I find in no other material of which I have any knowledge, and the matrix made with this material holds its sharp edges and maintains its perfect convex or concave form, which enables the die to co-operate therewith in a manner more perfect than any matrix that I have been able to make of any other material. I find, also, that with a cutting bed or roller made of this material it is unnecessary to renew the surface by planing, rolling, or otherwise treating the same, as is the case with other materials referred to, and I also find an efficient co-operation between the cutting-surfaces and such a roller to perform the cutting, and I find further that rollers of this material have great durability and are practically indestructible, and that the cost of producing them is much less than any other rollers for the same purpose of which I have knowledge. I find, also, that the same material used as a matrix for the die, as heretofore described, has great efficiency and utility, for the reason that when the matrix is made the material is so tough that the elevations corresponding with the depressions of the die will not break or chip off, as is the case with other materials that I have employed for the same purpose, nor do they flake or wear, as is the case with some metals that I have endeavored to use. Hence I consider that great utility is found in the employment of this material for this purpose over and above the use of any other for the same purpose.

What I claim is—

1. In a cutting machine, a cutting bed of vulcanized fiber substantially as described.

2. In an embossing machine an embossing bed made of vulcanized fiber substantially as described.

3. In a cutting and embossing machine the combination of a die having cutting and em-

bossing surfaces, the cutting surfaces being somewhat elevated above the embossing surfaces, in combination with a smooth cutting bed of vulcanized fiber to engage the cutting
5 surfaces, and a matrix of the same material to engage the embossing surfaces substantially as described.

Signed at New York, in the county of New York and State of New York, this 8th day of January, 1894.

BENZION KARFIOL.

Witnesses:

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