

F. E. ELLIS.
MATRIX MOLDING MAT.
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1,237,493.

Patented Aug. 21, 1917.

Fig. 1.

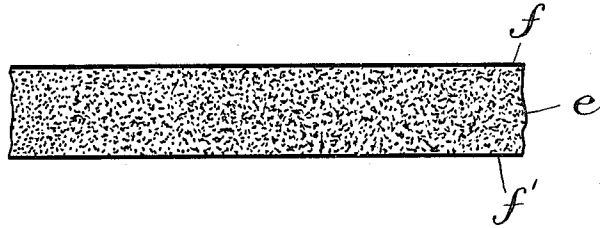
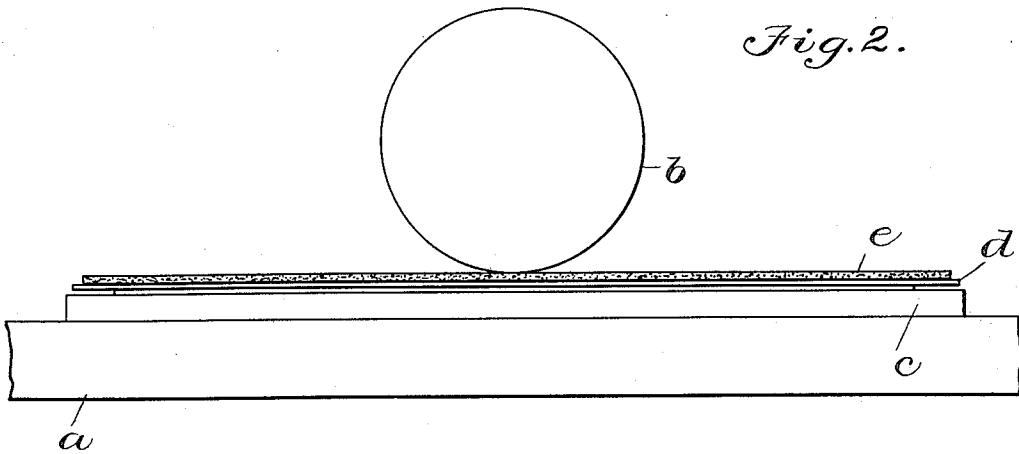


Fig. 2.



Inventor.
Frank E. Ellis
by Wright, Munroe, Denny & Hayes
Attorneys

UNITED STATES PATENT OFFICE.

FRANK E. ELLIS, OF REVERE, MASSACHUSETTS.

MATRIX-MOLDING MAT.

1,237,493.

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To all whom it may concern:

Be it known that I, FRANK E. ELLIS, a citizen of the United States, residing at Revere, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Matrix-Molding Mats, of which the following is a specification.

The present invention has reference to the art of producing molds or matrices for the casting of printing plates such as are used in newspaper printing. The method employed in making such matrices is to provide a pad composed of several layers of paper stock, ordinarily two comparatively thick layers of soft absorbent paper material, such as common blotting paper, and two or three sheets of tissue paper to provide a surface of close texture. These sheets are pasted together. The mode heretofore practised of converting such a pad into a matrix is to lay the pad, or blank, while still wet with the paste used in its construction on the type form with the tissue paper face next to the faces of the types, place a thick blanket on the back of the blank, and then apply pressure progressively on the blanket so as to force the soft matrix blank into the depressions of and spaces between the type faces, the pressure being ordinarily applied by a roll under which the form, with the matrix blank and blanket thereon, are passed.

My invention has to do with a mat adapted for such use. Heretofore the blankets used for this purpose have been made of wool woven into a thick fabric. These woolen fabrics have had to be relatively very thick with a heavy nap, as compared with ordinary textile fabrics, in order to press the matrix blanks well into the spaces between the faces of the types. The blanket is compressed in those parts which overlie the faces of the type, while those parts overlying the depressions and spaces between the type faces must have sufficient firmness to displace the matrix pad into such depressions. Thus a great amount of material is required in the blanket, whereby its cost of manufacture is high; and at the same time it is subject to rapid deterioration due among other things to the wearing away of the nap, and the compacting of the wool fibers in the web, so that in course of time it becomes harder and thinner than when first made, and therefore less compressible and

less resilient. Such blankets have to be frequently washed to remove the paste absorbed by them from the matrix blanks, and the washing and drying have the result of wearing away the nap and compacting the web.

It is my purpose to provide an article which can be used in place of the woolen matrix blanket heretofore used, with equally good or better results as to the character of the product turned out, which is not subject to the deterioration to which woolen blankets are subject as above pointed out, and may be produced at lower cost. The construction and characteristics of my new mat are set forth in the following specification in connection with the drawings. In the drawings,

Figure 1 is a sectional view of a fragment of the matrix mat embodying my invention.

Fig. 2 is a diagrammatic elevation of the essential parts of a matrix press.

I will first describe briefly the press as shown diagrammatically herein and then describe my novel mat in detail.

The essential parts of the press comprise a table *a* and a pressure-applying roll *b*, both being mounted on any suitable sort of base or frame and the roll being supported above the table in a sufficiently rigid manner to apply intense pressure to the articles placed on the table and passed under the roll. *c* represents a form containing printing types, or equivalents of such types adapted to form a positive in the matrix; *d* is a matrix pad or blank, which as previously pointed out, is ordinarily made of soft compressible wet paper material; and *e* is the mat which is laid on the back of the matrix blank. In one form of press commonly used the table is propelled by suitable mechanism so as to pass under the roll, which remains stationary except that it rotates upon its axis in contact with the article passing beneath it; but so far as my invention is concerned it is, of course, immaterial whether the table passes under the stationary roll or the roll is carried over a form lying on a stationary table. The roll is so placed and adjusted with respect to the combined thickness of the form, matrix blank, and mat, and is so rigidly held that it applies intense pressure over the narrow area of its contact with the mat, and this pressure is progressively applied over the whole length of the form, being trans-

mitted through the yielding and resilient mat so as to cause a deep impression to be made in the face of the matrix, offsetting parts of the matrix bodily into the depressions in the form.

The construction of my improved mat is shown in Fig. 1, which represents in cross section a fragment of the mat. It consists of a body *c* of material which is somewhat yielding and highly resilient, and two face layers *f* and *f'*. The material which I prefer to use for the body is granulated cork, the particles of which are united together by some suitable binding material, such as an oxidized vegetable oil. However, I do not limit the invention either to the specific binding material, or to cork as the body, but name the latter as a material which I have successfully used, and to illustrate the characteristics which the body of the blanket should possess. Any material capable of being made into a body sheet of thickness approximately uniform with smooth surfaces and having comparable qualities of resilience and compressibility may be used for the body.

The face layers in the mat which I have used and here illustrate are thin films of colloidal material which is flexible and tough and preferably consists mainly of nitrocellulose, in mutual solution with a sufficient quantity of suitable emollient (for instance castor oil or other non-drying oil), to keep it flexible and prevent it from becoming hard and brittle. In this respect also, however, I do not restrict the invention, but include for the face layers any other material having properties of toughness, elasticity, and resilience substantially the equivalent to those of modified nitrocellulose. These nitrocellulose layers are applied in semi-liquid condition in solution with a volatile solvent such as alcohol, ether, acetone, or other solvents suitable for the purpose. Preferably each face layer is made of a number of thin films applied successively one upon another after drying of the film previously deposited, until a layer of the desired thickness has been constructed.

In one form of mat which I have produced the body is approximately twenty-two one-hundredths of an inch thick and the face layers slightly less than one one-hundredth of an inch each in thickness, but it is within my contemplation to make any of the layers thicker or thinner than the amounts indicated.

The mat above described is sufficiently yielding and compressible to transmit the pressure of the matrix forming roll to the matrix blank in the required manner, and is sufficiently firm to indent the matrix blank into the depressions of the type form, producing the deep impression of the types in the matrix blank which is necessary in order

that an operative printing plate may be molded thereon. The mat is also sufficiently resilient within the limits required for matrix making so that after passing through the press it restores itself to its original form and thickness.

The office performed by the surface facings of nitrocellulose is to protect the surfaces of the body layer and bind the whole layer together. While a cork conglomerate of the sort here described is brittle by itself and has very little tensile strength, the combined mat has great tensile strength, and can be bent on a curve of very small radius without breaking. This strength is imparted wholly by the facing layers which are intimately united at all points with the body by adhesion and penetration among the surface particles of the body. As this body is homogeneous, that is, of the same nature and material throughout, as well at its surfaces as in its interior, and as the facings are applied directly to such surfaces, the entire mat has only the desirable qualities of its two main elements; viz. the compressibility and resilience of the body, and the toughness, flexibility, elasticity, imperviability and smoothness of the facing layers, without any of the qualities of other materials, such for instance as woven fabrics which are more or less rough, inextensible and inelastic, which would be objectionable in a mat of this character.

A mat as herein described is not subject to the deterioration to which a woolen blanket of the sort heretofore used is subject. This mat is impervious to moisture and therefore does not absorb any of the water or adhesive from the matrix blank. The surfaces are smooth and so repellent, or at least have so slight a quality of adhesion, with respect to water and the other ingredients of paste, that the paste and water squeezed from the matrix pad by the pressure of the press ordinarily does not adhere to these surfaces. If on occasion an excessive amount of paste should be expressed from the edge of the pad and remain on the surface of the mat until dry, it can be readily wiped off. On account of this fact and of the fact that nothing can penetrate through the surface layers to the interior of the mat, it does not require washing. Containing no fiber in its construction and not being dependent for its elasticity and resilience upon matted fiber, it does not become diminished in thickness or in its quality of resilience through long continued use, but remains serviceable as long as the surface layers remain unbroken.

While I have hereinbefore described a specific use for my improved mat to which the same is particularly well adapted, I would state that I do not limit it to that use, but that I include within my claim to

protection an article having the physical characteristics of the mat herein described whatever the use to which it may be put.

What I claim and desire to secure by Letters Patent is:

1. A matrix mat comprising a homogeneous body of compressible resilient material and a smooth facing of a tough colloidal substance applied directly to the surface of said body.

2. A matrix mat comprising a homogeneous body of compressible resilient material and smooth facings applied to the surfaces on both sides of said body composed of tough colloidal material.

3. A matrix mat comprising a broad body, substantially uniform in thickness, made of homogeneous compressible resilient material, with a facing layer of tough colloidal material having a smooth surface applied directly to the surface of said body.

4. A matrix mat comprising a broad body, substantially uniform in thickness, made of granular compressible resilient material with a suitable binder, and facings on both sides of said body consisting of films of colloidal material applied directly and united by adhesion to the surfaces of said body and having substantial strength.

5. A matrix mat comprising a body sheet of granulated cork, the particles of which are joined together by binding material, and facings of nitrocellulose composition adherently united directly to the opposite sides of

said body sheet, having sufficient thickness to lend material tensile strength to the combined structure.

6. A matrix mat comprising a body sheet of granulated cork, the particles of which are joined together by binding material, and facings of nitrocellulose composition adherently united directly to the opposite sides of said body sheet, having sufficient strength to prevent the body sheet from breaking when bent.

7. An article of manufacture comprising a body sheet of substantially uniform thickness and composed of resilient elastic and compressible material, with face layers on opposite sides thereof firmly and directly united thereto and composed of a tough colloidal substance.

8. An article of manufacture consisting of a body sheet of granular yielding resilient material the particles of which are bound together, and face layers on opposite surfaces of said body closely united directly to the surface particles thereof and composed of tough flexible colloidal substance.

9. An article of manufacture consisting of a body sheet of granulated cork the particles of which are bound together, and layers of nitrocellulose directly on the opposite faces of the body.

In testimony whereof I have affixed my signature.

FRANK E. ELLIS.