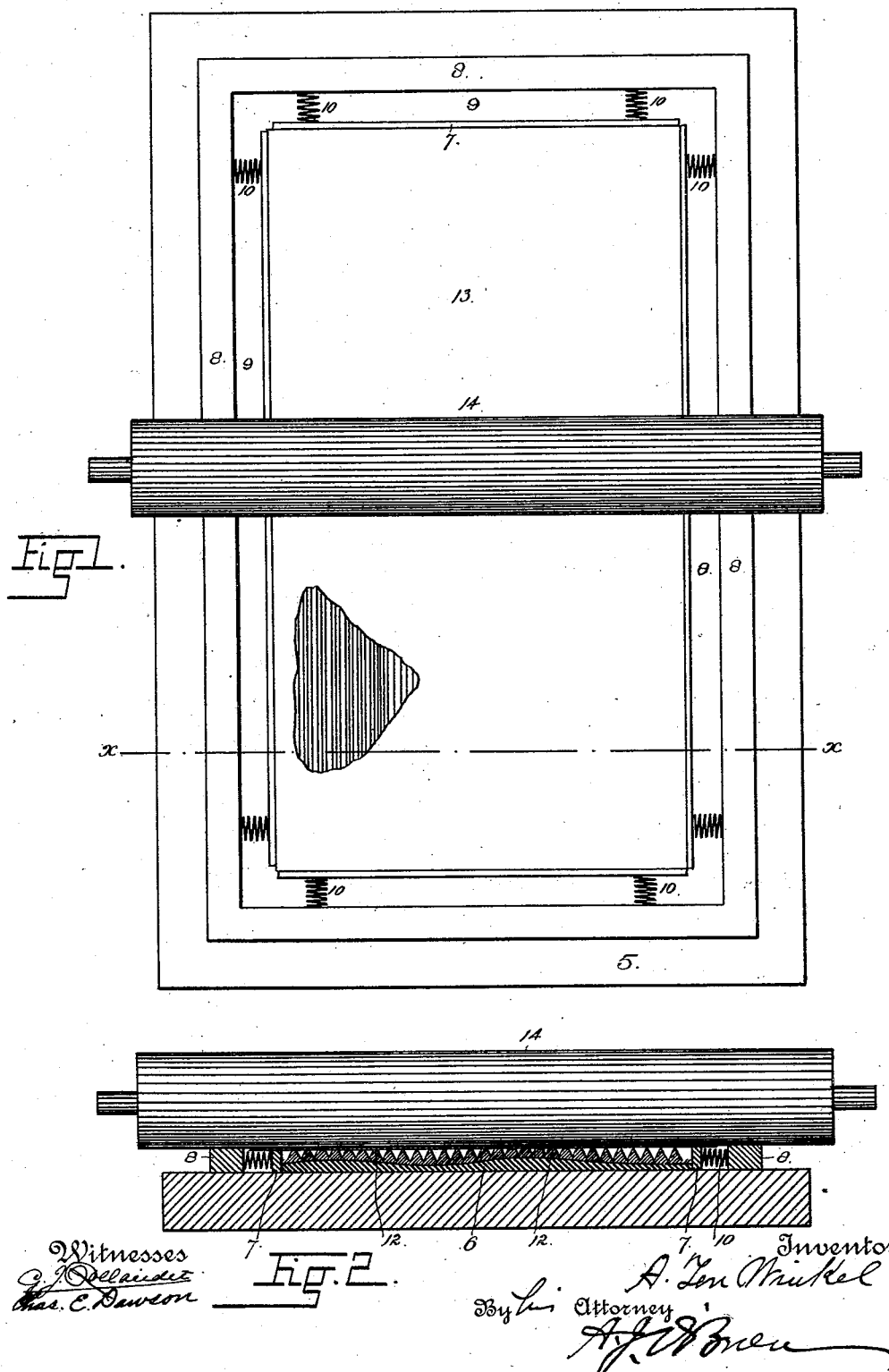


(No Model.)

A. TEN WINKEL.
PROCESS OF PRODUCING PRINTING SURFACES.

No. 522,566.

Patented July 3, 1894.



UNITED STATES PATENT OFFICE.

AUGUST TEN WINKEL, OF DENVER, COLORADO.

PROCESS OF PRODUCING PRINTING-SURFACES.

SPECIFICATION forming part of Letters Patent No. 522,566, dated July 3, 1894.

Application filed December 26, 1893. Serial No. 494,808. (No specimens.)

To all whom it may concern:

Be it known that I, AUGUST TEN WINKEL, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented a certain new and useful Process of Producing Printing-Surfaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to an improved process for producing printing surfaces for use in a typographic press, and whereby any desired variety of shading, from the lightest to the heaviest, may be obtained.

In carrying out my process, I first produce a film having lines or dots of uniform height, and sufficiently hard or rigid that they may be cut or ground down to give the desired variety of shading upon the printed surface.

The greater the degree of cutting or grinding to which the film is subjected, the heavier or darker will be the shading upon the printed surface. Hence it will be observed that the surface of the film may be so cut or ground

that any variety of shading may be obtained therefrom between the extremes of white and black. The body of the film must be sufficiently flexible that those parts thereof corresponding to the portions cut or ground

down, may be raised to the plane of those parts which are of the normal or original height (not having been cut down) whereby the entire surface of the printing film is made type-high. This is accomplished by placing

the back of the prepared film having its printing surface uneven, upon a confined bed of some suitable plastic composition to which the film is glued and pressing the film into said composition, whereby the unevenness of the

printing surface is transferred to the back of the film in the reverse order; that is to say, the parts of the back which are raised highest correspond with those parts of the printing surface which were lowest after the face

of the film had been subjected to the grinding or cutting down process, and so on, the entire printing surface being brought to the

same plane. The plastic material forming the base of the film is then allowed to harden, after which the printing surface is ready for use in the press.

The film is originally formed by placing a sheet of celluloid between two pieces of unbleached cotton cloth, and then applying to both these covered surfaces, pieces of blotting paper moistened with spirits of camphor. The function of the cloth is to prevent the blotting paper from adhering to the surface of the celluloid. The celluloid sheet is then allowed to remain until it is softened sufficiently to receive an impression from a suitable pattern or mold. Then the blotter sheets are removed from the surfaces covered by the cloth, and the cloth also removed from one surface of the sheet of celluloid. This exposed surface of the celluloid sheet is placed downward upon a suitable pattern or mold, and a rubber blanket placed upon the opposite surface which is then subjected to a suitable pressure, as by passing a roller thereover, whereby the softened celluloid is pressed into the mold to produce the face of the film, which, when removed from the pattern or mold is of uniform height.

Before the celluloid is applied to the pattern, the latter is oiled to prevent any parts of the celluloid from adhering to the pattern, whereby its removal may be effected without injury to the imprinted face thereof.

The pattern may consist of a fine screen of any desired mesh, or a specially prepared pattern of any design, as a surface composed of small conical projections having their apices outward and separated by counterpart interstices into which the softened celluloid is pressed to produce the required result. After the celluloid or other suitable sheet of plastic material has received the imprint of the pattern, it is allowed to harden to its original condition or consistency before it is removed therefrom. After it is removed from the pattern or mold, the imprinted surface is subjected to the process of grinding down, or cutting away, heretofore described.

The apparatus employed in carrying out my process will now be described, reference being had to the accompanying drawings in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a top or plan

view of the apparatus; and Fig. 2 is a section taken on the line $x-x$, Fig. 1.

Similar reference characters indicating corresponding parts or elements in these views, let the numeral 5 designate a block of wood, to the upper surface of which is glued a quantity of plastic material which should be spread evenly over the surface of the board and cover a space thereon equal in area to that of the film. This composition is confined and surrounded by four pieces of wood 7. Outside of these pieces 7 and surrounding the same is the rectangular steel frame 8 separated from the pieces 7 by a suitable space 9. Between the pieces 7 and the frame 8 are placed a number of coil springs 10 of sufficient strength to normally maintain the wood-pieces in contact with the outer edges of the composition 6. A coating of glue is then applied to the upper surface of the composition 6, and the back or smooth surface of the film 12, which is covered with the cloth, applied thereto, the opposite, or printing face of the film having been cut away in places to give the desired variety of shading upon the surface to be printed. This printing, or upper surface of the film, is then covered by a thin sheet of zinc 13, after which, a roller 14 engaging the steel frame is passed over the zinc sheet until the film is pressed sufficiently to make its upper surface smooth. The springs 10 will yield sufficiently to allow space for the composition 6 to spread out and force the pieces 7 into the space 9 or toward the adjacent part of the steel frame, if this should be necessary in order to allow the roller to engage said frame.

The printing surface of the film, or the zinc plate placed thereon, will, when the film is first placed upon its composition bed, lie in a plane somewhat above the plane of the upper surface of the steel frame, in order to allow the roller to act upon the film for the purpose stated, before it (the roller) engages the frame. Hence the excess of composition will be crowded outward, and the wood pieces must yield to make room therefor. It will thus be seen that the function of the steel frame is to act as a guide for the roller in bringing the entire printing surface of the film to the same level or plane, the use of the roller being continued until, when passing over the film, it engages every part of the frame.

After the film has been shaped as heretofore explained, the zinc sheet is removed and the composition bed allowed to harden. The wood base 5, the composition 6 and the film 12 taken together, are exactly type high, and form a solid mass which may be used in a press.

Where a smooth portion of any design is required on the printed surface, a piece of celluloid is cut of the same shape as the required smooth portion and pressed into the printing surface of the film until it lies in the same plane therewith. Preparatory to apply-

ing this piece of celluloid, it is first softened on one side by dipping it in spirits of camphor, and a piece of some suitable fabric, as unbleached cotton cloth, applied thereto, sufficient pressure being used to cause the cloth to adhere to the surface. The opposite side of the piece of celluloid is then softened in the same manner and applied to the film by pressure upon its cloth-covered surface; the cloth upon the surface keeps the softened celluloid from spreading under pressure. If it is too thick and projects above said surface, it must be ground or cut down in any suitable manner. These smooth surfaces of the printing surface, will, of course, print solid black, or any other color, according to the color of the ink employed. When it is desired to print any object in several colors by the use of my improved printing surface, as many of the surfaces are employed as there are to be colors. The object is outlined on each surface, and each is employed to print a different part of the object, the rest of the surface being cut away in each case. Hence by printing from the several surfaces in succession, the entire object will be reproduced with each part in a distinct color.

Though I have described the film in the specification as made of celluloid, I do not limit myself to the use of this material, as the film may be made of any other material which may be found suitable, though in my experiments I have found celluloid preferable.

In further explanation of the use and advantages of my improved process, it may be stated that by cutting a slit in the film and grinding the surface down on one side of the slit, and closely thereto, the lightest shade may be brought close to the darkest shade in printing, since the portion of the surface ground down, may be raised to a level with the continuous portion, which is of the normal height, not being ground down.

Having thus described my invention, what I claim is—

1. The process herein described for producing a printing surface, which consists in forming a film whose printing face is of uniform height, cutting or grinding down this face in places to produce the shading required on the surface to be printed, subjecting the film to pressure upon a suitable yielding base, whereby its entire printing surface is brought to the same plane or level, substantially as described.

2. The process herein described, which consists in first forming a film having a printing surface of uniform height, the back being yielding and the face sufficiently hard or rigid; second, in cutting down the surface of the film in places; and third, in subjecting the film to pressure upon a yielding composition which engages its back, whereby the entire printing face is brought to the same plane or level, substantially as described.

3. The process herein described for pro-

ducing a printing surface, which consists in first forming a film having a printing face of uniform height, cutting down said face in places, and then restoring the entire printing face of the film to the same plane or level, substantially as described.

4. The process herein described for producing a printing surface, which consists in forming a film of the character described, cutting or grinding down its face in places, placing its back upon a yielding composition provided with a solid support, surrounding the composition with yielding pieces, and subjecting the face of the film to pressure,

whereby its entire printing surface is brought to the same plane or level, substantially as described.

5. A printing film of the character described having a hard face and a yielding back, whereby it may be cut or ground down in places to give the shading required upon the surface to be printed, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

AUGUST TEN WINKEL.

Witnesses:

CHAS. E. DAWSON,
A. J. O'BRIEN.