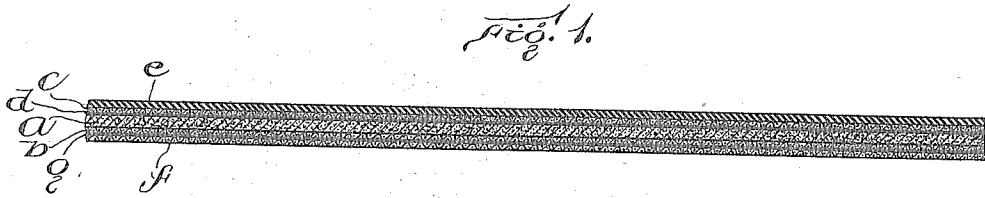
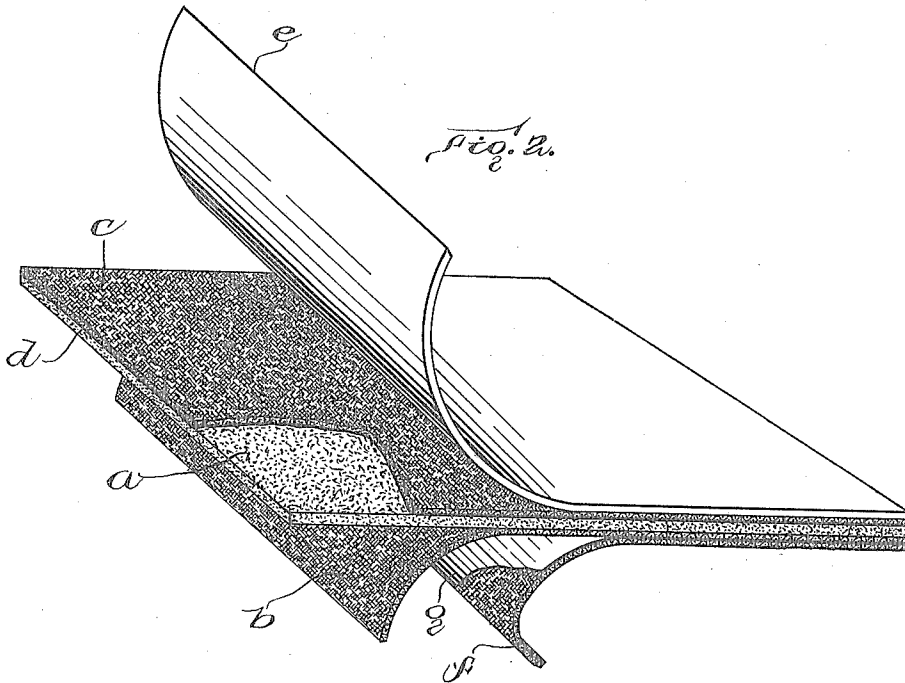


F. E. ELLIS.
PRINTING BLANKET.
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PRINTING-BLANKET.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK E. ELLIS, of Revere, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Printing-Blankets, of which the following is a specification.

The present invention relates to blankets for use in printing presses, and has for its object to provide a new and improved blanket especially designed for lithographic or offset printing, that is that class of printing in which the design or text is taken from the printing plate or stone by the blanket and is transferred from the surface of the latter to the paper or other substance being printed upon. Blankets adapted to perform this sort of work must have a smooth printing face of even texture and must be resilient in uniform degree throughout its extent. If the blanket does not possess these qualities, it will cause the design to slur in being transferred to the paper or other substance being printed upon. Blankets for lithographic and offset printing have heretofore been made largely of rubber by which I mean a composition containing rubber gum with other ingredients, such as is commonly and ordinarily understood by the term rubber, built up in a number of layers with plies of friction fabric, the entire blanket having a smooth face of rubber. Hitherto blankets of this sort have been of two classes: one which is known in the trade as the knife face or skin face blanket, has for the rubber constituent of its structure a number of sheets or layers formed by spreading a solution containing rubber and a vulcanizing agent over the surface of fabric plies and adding enough of such layers to bring the blanket to the required thickness. The other type of blanket is constructed of rubber dough composed of rubber gum ground up with litharge, talc, sulfur and other substances applied to a number of plies of fabric and with a sufficient body on one face to provide the printing surface, the whole being vulcanized into a unitary fabric and the face being ground off to make the blanket of uniform thickness.

Both of the above described forms of blanket are defective in one respect or another. The skin face blanket, while having a printing surface of the desired texture and finish for printing, is yet very uneven as to thickness and stretches badly. It cannot

be ground on the printing face to an even thickness, because grinding destroys the texture of the face and makes it unfit for printing. The other type of blanket is too hard and too little resilient to produce the best results in offset printing. Both forms of blanket are expensive to make and are subject to very rapid deterioration by the destructive action of the oils contained in printers' inks, which attack the rubber printing face, causing it to blister and rendering it useless for printing in a very short time.

My object is to produce a printing blanket suitable for lithographic and offset printing as well as for other uses, which combines the advantageous features and eliminates the defects of both the old forms of blanket, and may be obtained by the user at a lower cost than the old blankets. The manner in which I have accomplished this object and the characteristics of my new blanket appear from the following description.

The invention consists both in a new and improved blanket and in the method by which such blanket is produced.

In the drawings, Figure 1 is a sectional view enlarged of a blanket embodying my invention. Fig. 2 is a perspective view of a fragment of such blanket showing the plies or layers thereof partially separated.

I will first describe the method of making the blanket and the ingredients entering in its composition. I first provide a body layer of a cork composition, such body layer being made by grinding a high grade of selected cork into a condition of fineness resembling coarse flour or fine meal, mixing the ground cork with an oxidizing oil, such as rape seed oil, and spreading the composition of mixture smoothly over a ply of textile fabric by means of calendar rolls or in any other suitable manner. The oxidizing oil will dry, and when dried the cork composition is soft and pliable.

In the drawings, *a* represents the cork layer and *b* the fabric layer on which the same is applied, as above described. As the cork composition is spread upon the sheet of textile fabric while in the plastic condition, it conforms to the texture of the fabric, entering to some extent in the spaces between the threads thereof, so that when dried it is firmly interlocked with the fabric and securely united thereto. The dried oxidizing oil forms a very firm binder, unit-

ing the particles of cork to one another whereby those particles of cork which enter the meshes of the cloth effectually lock the cork layer to the cloth.

6 The layer of cork with its fabric backing forms the body of the blanket, and after being thoroughly dried is prepared for union with the face layer or ply of the blanket in the following manner: The surface of the
10 cork layer is first washed with a weak alkaline solution to remove the oil or oily coating upon such surface. The alkali which I prefer to use for this purpose is potash. I then form a coating of rubber on this sur-
15 face of the cork layer by spreading evenly over the same a solution of rubber gum. Such solution may have naphtha or any other solvent as the vehicle for the rubber gum, and contains sulfur or any other in-
20 gredient or ingredients necessary or useful to effect vulcanization. I then lay over the rubber coated face of the cork layer a sheet of textile fabric which has been thoroughly stretched and previously coated with the
25 same solution. The coated sides of the cork and fabric of course are laid together. This layer of fabric is shown at *c* in the drawings, and the intermediate layer produced by the drying of the dissolved rubber com-
30 position is indicated in Fig. 1 by the heavy line at *d*.

On the outer face of the fabric ply *c* I spread a layer *e* of rubber composition of the sort known in the art as rubber dough or
35 green rubber; the same being a mixture of rubber gum with any of the ingredients used in rubber manufacture for making the composition vulcanizable and giving it the desired color.

40 A blanket composed of the parts above described is complete for some purposes, of course after having been vulcanized, but for other purposes to make a better blanket I provide a final layer on the opposite side
45 of the blanket from the face *e*. This layer is a fabric ply *f* which is attached to the back of the fabric ply *b* by a coating *g* of vulcanizable rubber solution or cement in the same manner that the ply *c* is united to
50 the face of the cork layer. The whole blanket is then vulcanized by heat and pressure, preferably in a flat condition in a vulcanizing press, wherein it is held under great pressure and subjected to a tempera-
55 ture of 325 degrees Fahrenheit more or less for a period of from twenty-five to thirty minutes, whereby the uncured layers of rubber dough and dried cement are vulcanized. After vulcanizing, the surface of the face
60 layer *e* is made smooth and the blanket brought to exactly even thickness by grinding or buffing the outer surface of the layer *e* sufficiently to remove all irregularities.

I do not limit the steps of the method of
65 manufacture above described to the particu-

lar order described in respect to applying the fabric layer *f*, since such layer may be applied to the back of the layer *b* before the fabric *c* is applied to the face of the cork layer *a*; that is, the order in which the plies
70 *c*, *f* and *e* are applied to the body layer may be altered without departing from the invention.

The blanket resulting from the process of manufacture above described possesses a pliable and soft body which is not capable of stretching, and moreover is reinforced so
75 thoroughly on both sides by strong sheets of fabric as to be prevented from breaking under tension. The blanket has a printing surface with the desired texture and smooth-
80 ness and has the necessary characteristic of uniform thickness. My blanket has greater softness and resilience than the type of all rubber and fabric blanket, which is built up
85 of frictioned fabric plies and a layer of rubber dough, while it has the even thickness and the resistance to stretching of which the lack are serious defects in the skin face blanket.

As an indication of the advantage derived from the resilience of the blanket, it may be observed that in lithographic stone presses the stone becomes worn down as a result of
90 repeated grindings to remove the design, and that with the ordinary rubber blanket it is impossible to use a stone after the same has become worn to a thickness of about two and one-half inches. The greater softness
95 and resilience of my blanket enables the stone to be used for a much longer time, that is after it has become reduced to a thickness much less than that above indicated.

Practically all the rubber in the blanket is contained in the layer *e*, which is only a
105 small fraction of the thickness of the entire blanket, and as the cork and fabric parts of the blanket are much less expensive than rubber, the entire blanket can be made at much less cost than those heretofore made.
110 I claim:

1. A printing blanket comprising a body layer of cork composition, a rubber face layer in vulcanized union with one face of said body layer, and a sheet of textile fabric
115 united to the opposite face of said body layer.

2. A printing blanket constructed of a face layer of vulcanized rubber, a body layer of a soft and pliable composition other than
120 rubber, vulcanized to the face layer, and a backing layer of textile fabric united to said body layer.

3. A printing blanket consisting of a body composed of a textile fabric ply and a sheet
125 of granular cork and oxidized oil, bonded together, a second fabric ply bonded to the first fabric ply by a coating of vulcanized rubber, a third fabric ply bonded to the face of the cork sheet by an interposed sheet
130

of vulcanized rubber, and a surface of vulcanized rubber united by vulcanization to the outer side of said third ply.

4. A printing blanket particularly adapted for offset printing having a smooth printing face and being of uniform thickness, and constructed mainly of resilient material other than rubber.

5. A printing blanket particularly adapted for offset printing comprising a body composed of a plurality of textile fabric plies and a sheet of cork composition, with a surface layer having a smooth outer face.

6. A printing blanket particularly adapted for offset printing comprising a body composed of a plurality of textile fabric plies and a sheet of cork composition, with a surface layer having a smooth outer face, and being of such thickness as to make the entire blanket uniformly thick at all points.

7. A printing blanket particularly adapted for offset printing comprising a body of soft, flexible, resilient material other than rubber, a fabric backing layer securely bonded to said body, and a face layer of a surface texture and smoothness suitable for a printing surface.

8. A printing blanket particularly adapted for offset printing comprising a body of soft, flexible, resilient material other than rubber, a fabric backing layer securely bonded to said body, and a rubber face layer of a surface texture and smoothness suitable for a printing surface united by vulcanization to the body, the entire blanket being of uniform thickness at all points.

9. A printing blanket having a body of pulverized cork mingled with an oxidized vegetable oil, a textile fabric ply bound to one face of said body, a fabric ply bound to the opposite face of said body by vulcanized rubber, and a rubber face layer vulcanized to the outer side of the second fabric ply.

10. The method of making a printing blanket which consists in providing a body layer of cork composition having a fabric backing ply, making the face of said body layer adhesive to rubber, laying a fabric ply and an interposed film of unvulcanized rubber upon the face of said body layer, placing a face layer of rubber composition on the outer side of the second named fabric ply, and vulcanizing the entire structure.

11. The method of making a printing blanket which consists in providing a body

layer of cork composition mingled with an oxidized vegetable oil in dried condition and having a fabric backing ply, washing the face of the body layer with a solution capable of removing oil, laying a fabric ply and an interposed film of rubber upon the face of said body layer, placing a face layer of rubber composition on the outer side of the second named fabric ply, and vulcanizing the entire structure.

12. The method of making a printing blanket which consists in providing a body layer of cork composition consisting of pulverized cork bonded with an oxidized vegetable oil in dried condition and having a fabric backing ply, washing the face of said body layer with an alkaline solution to remove the oily coating of such face, laying a fabric ply and an interposed film of rubber upon the face of said body layer, placing a face layer of rubber composition on the outer side of the second named fabric ply, and vulcanizing the entire structure.

13. The method of making a printing blanket which consists in taking a body consisting of a sheet of pulverized cork mingled with an oxidizable oil and a backing layer, in a substantially dried condition, removing the oily coating from the face of said sheet by washing the same with a caustic alkaline solution, attaching a fabric ply to the washed face of the body sheet with an interposed layer of vulcanizable rubber, spreading a layer of vulcanizable rubber composition on the face of said fabric ply, and vulcanizing the entire structure.

14. The method of making a printing blanket which consists in taking a body consisting of a sheet of pulverized cork mingled with an oxidizable oil and a backing layer, in substantially a dried condition, removing the oily coating from the face of said sheet by washing the same with a caustic alkaline solution, attaching a fabric ply to the washed face of the body sheet with an interposed layer of vulcanizable rubber, spreading a layer of vulcanizable rubber composition on the face of said fabric ply, placing a fabric sheet with an interposed layer of vulcanizable rubber on the back of said backing layer, and vulcanizing the entire structure.

In testimony whereof I have affixed my signature.

FRANK E. ELLIS.