Feb. 18, 1941. S. B. NEILEY 2,232,664

PRINTING BLANKET

Filed April 14, 1937

Fig. 1

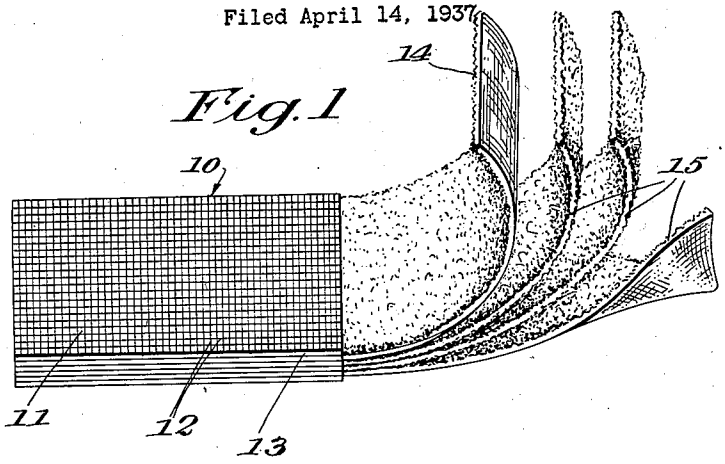



Fig. 2

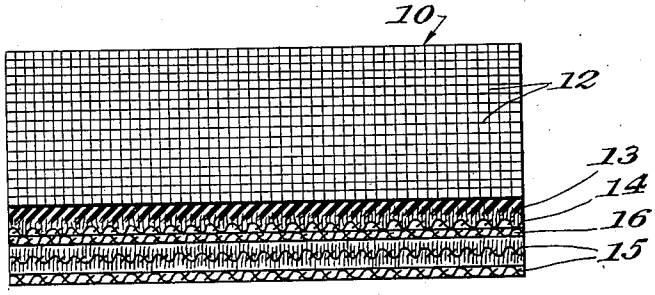
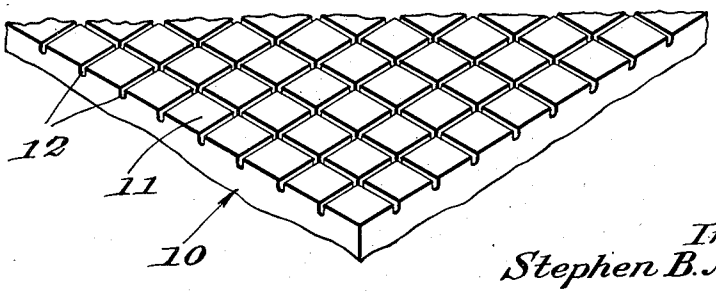



Fig. 3




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# UNITED STATES PATENT OFFICE

2,232,664

## PRINTING BLANKET

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Application April 14, 1937, Serial No. 136,889
In Great Britain October 26, 1936

6 Claims. (Cl. 154—54.5)

This invention relates to printer's blankets and is particularly adapted both to textile printing blankets known as the "wash" type and to news print blankets used in the printing of newspapers.

The objects of the invention are to provide a "wash" blanket suitable for use in printing textiles without a back gray, to provide a blanket having storage reservoirs for excess color, to prevent the collapse of the storage reservoirs under the printing pressure and to provide a blanket of the news print type which is less susceptible than are present blankets to "offset." These and other objects will become apparent from the specification and from the drawing in which Figure 1 shows a top view of the blanket but includes, also, an exploded view which illustrates better the component parts;

Fig. 2 shows my improved blanket in section;

Fig. 3 is an enlarged detail top view of a portion of the blanket which shows the nature of the storage reservoirs which I provide.

Since the conditions met by news and textile printing blankets are materially different and demand different constructions in the blankets themselves, I shall describe these two blankets separately.

The "wash" blanket, commonly used in textile printing, consists of a number of plies of sheeting having rubber calendered thereon. Its surface is smooth and the blanket is water impervious because it is continuously washed free of excess color and dried on each passage of the blanket loop through the press. It must be used in conjunction with a back gray, a length of textile material placed between the blanket and the goods being printed to absorb the excess color which is driven through the goods by the pressure of the print roll. In some manner, however, the smooth, impervious surface of the "wash" blanket seems to prevent the full absorption of color by the back gray and for this reason "wash" blankets usually have given a less satisfactory bloom of color to the printed goods than do the all-fabric blankets which possess great color absorptive capacity. The drawback of the fabric blanket is that the color penetrates far into the blanket, which, in time, becomes hard, brittle and cracks, whereas the rubber blanket is freed of all color during its use.

To improve the bloom of color, it has been proposed to pit or indent the surface of the rubber impregnated "wash" blanket in the hope that the pits would provide further storage areas for the color and that the back gray and the blanket together would allow enough color to strike through to improve the bloom. So far, the results have been disappointing. The printing pressure is so high that under normal conditions the walls of the pits are flattened as the print roll passes over them and the pitted, rubber-surfaced blanket, in consequence, has shown no improvement in color carrying capacity.

In my application Serial #56,187, filed December 26, 1935, I disclosed a construction of a printing blanket which gives remarkably long life under the working imposed by the printing press and I further showed a special type of surface treatment which provides a multiplicity of storage pits in the surface of the blanket, the walls of which are so strongly reenforced that they withstand the printing pressure without collapse. This type of blanket not only permits a high bloom of color to be given the printed goods when a back gray is used, but so successfully carries away the excess color that a back gray is unnecessary. The present invention is an improvement upon the blanket therein disclosed.

In the above mentioned application, the pits or surface indentations, which form the dye storage reservoirs, are made by thoroughly impregnating a sheet of muslin with latex, squeezing the impregnated sheet to such an extent that, although the threads remain coated with rubber, the interstices between the warp and filling are left open, and then this rubber impregnated sheet is applied to what overwise would be the working surface of my printer's blanket. Thereafter, the surface ply is carefully rolled into secure contact with the surface and the complete assembly is then vulcanized either in a large belting press or by maintaining the whole blanket at the proper elevated temperature. Although this blanket is highly satisfactory, special blanket washing machinery, such as that disclosed in the patent to Moreland et al. #2,057,903, subjects the blanket to such an intense washing and drying operation that, for this service, the rubber impregnated surface ply is neither as waterproof nor as wear resistant as could be desired.

My improved blanket is made as follows. As I disclosed in the application to which I have referred, a number of plies of napped textile sheeting are impregnated in a bath of concentrated rubber latex, and then squeezed only to such an extent that the final product has 70% rubber and 30% fiber in its make-up. A number of such plies are laid up in a laminated structure and a layer of an 84 x 64 broken twill (weight basis .99 yard to the pound of 54" goods) is run through the same latex bath and squeezed to give the same proportion of rubber and fiber in the napped

surface. With its napped side uppermost, this is laid on the laminations to form a surface ply and the whole assembly is now passed through a belting press where the blanket is vulcanized. Prior to closing the press, I lay across the surface ply a screen, preferably square-woven 36 x 36 wires .010" in diameter to the square inch. The blanket thus formed, as is shown in the figures, has a working surface formed of flat topped projections with storage reservoirs surrounding each projection .010" in depth and width.

Such a blanket contains such a high proportion of rubber in its working surface that it is essentially waterproof and withstands the high speed washing and scrubbing action of the Moreland machine without difficulty.

The broken twill construction allows a very high nap to be raised from the filling without weakening the warp threads and the individual fibers raised from the filling so reenforce the working surface and the walls of the pits that they do not collapse even under the heavy pressure used in the printing of fine shirtings. I have found, further, that this construction allows a blanket to be made which possesses much longer life, for the indivdulalized fibers, which stand up from the textile back much as the teeth stand up from the rib of a comb, are separately hinged and may distort together with their rubber matrix without transmitting so great a strain to their associated fibers that they cause breakage. Because they assume a generally vertical position, their columnar strength aids in resisting compression, and because they are present in such large quantity, their reenforcing effect upon the rubber is sufficient to prevent the collapse of the storage areas.

I have set forth the above specific example of my improved surface ply as best illustrative of the form which I prefer, but its use is not limited to blankets of that specific construction. On the contrary, obviously, it may be attached to a blanket of any type. It also follows that textile material such as a hard, woven duck or a foraminous sheet of metal may be substituted for the wire screen and, further, that the screen itself may possess a different weave and different wire diameters from those I have set forth. The particular size which I have given is, however, so fine that no trace of the impression mark can be seen in fine pattern shirting goods, yet it is coarse enough to provide ample storage capacity for the excess color. Obviously, therefore, the size and the shape of the storage reservoirs may be varied to suit the type of goods being printed and the pattern which is being applied.

Alternatively, a reenforced working surface may be given a blanket in the following manners. A fibrous substance, such as cotton floc, may be added to compounded latex in such proportions that the dried product contains about 30% fiber and 70% rubber. This compound may be spread upon the surface of any blanket in a commercial spreading machine, dried and then vulcanized against a screen in a belting press as I have described. Or, cotton floc, well wet with latex, which has been coagulated and dried may be milled into a base stock of compounded rubber, (by wetting the floc first with latex much more may be milled into the rubber than otherwise is possible before a "short," crumbly stock is encountered). Subsequently, the sheeted stock is applied to the surface of a blanket which is vulcanized in the press as before.

In news printing, since no makeready is used on the presses, a flexible packing on the impression cylinder is necessary in order to obtain some semblance of a uniform printing pressure. Previously, news blankets have been coated felts or plied-textile assemblies having a smooth, impervious and, preferably, an ink resistant face made of pyroxylin or some analogous substance, rubber or the polymers of ethylene poly-sulphide. In a news press, the distance between the cylinders which print the first and second sides of the web is so short that the ink applied to the first side has no opportunity either to become absorbed or to dry before it is immediately carried against the second side blanket and driven onto it with the full pressure applied by the stereotype face. Second side news printing blankets, accordingly, become smeared with ink which is picked up from the surface of the moving web.

Since news blankets preferably possess a greater compressibility than textile printing blankets, I prefer to increase the compressibility and resiliency by either of two methods: first, by adjusting the squeeze which follows the impregnation of the foundation layers of textile material to such a degree that materially more than 70% is left in the impregnated sheet; or, second, by drying the foundation layer thoroughly after impregnation. If the impregnation bath contains 70% of solids, this last means that 30% of voids, the original volume of the water, will exist in the dried sheet. A resilient bridgework of rubber intimately associated with the fibers now exists which may be partially compressed into the voids left by the water. This spongy structure is more compressible than a solid system.

A number of such plies are assembled as I have described before and I then apply the same twill, this time, however, impregnated with a water dispersion of rubber or, if maximum resistance to news-oil is required, I may impregnate the top ply with various resilient substances such as chlorinated rubber, rubber substitutes such as polymers of chloroprene and butadiene and polymers of ethylene poly-sulphide. As occasion requires, the materials may be used in water dispersion or in their dissolved form.

Alternatively, also, cotton floc may be added to a disperson or a solution of these rubber-like plastic polymers and the mixture applied to the surface of a blanket by spreading it in known manners. It is also possible to produce news blankets by coating an unimpregnated wool felt with the above materials or applying, as a top layer, a sheet of impregnated napped, broken twill as I have above described. This latter blanket depends, in a large measure, for its resiliency upon the felt itself. Blankets coated in the above manners are vulcanized in a press against a wire as before.

When applied to a news press, it will be found that the storage areas which I have provided are not crushed by the printing pressure applied through the stereotype. Rather, under the printing pressure, the ink slides across the raised portion and collects in the storage areas. Further, the area of contact between the blanket and the wet web is greatly cut down. Such blankets are freer from "offset" and "second side effect" than those having a plain face.

Referring to figures, the part **10** of Figures 1, 2 and 3 indicates a portion of the finished blanket. Its working surface **11** is indented at the wire-marks **12—12**. The exploded portion of Fig. 1 illustrates the blanket construction. The broken twill **14**, napped on one side, is laid upon

the lower reenforcing layers of napped twill or sheeting. All of these in the finished blanket are securely imbedded in the matrix 13 of rubber. In Fig. 2, the sectionalized part of the drawing is presented as if the rubber matrix extended only a short distance below the surface. This convention has been adopted merely to illustrate better the construction of the blanket. In actual practice all plies are thoroughly impregnated. It will be seen that the blanket is built up from a number of plies 15—15 of napped sheeting or twill and may be reenforced by a layer 16 of impregnated canvas. Fig. 3 is an enlarged view of the surface of the blanket where the indentations 12—12 are more clearly shown.

Although I believe that the fullest benefits of my invention are realized when a napped, impregnated textile is made the top ply, the alternative methods I have given produce blankets which are quite effective under certain conditions. Essentially, therefore, my invention consists in forming a working surface for a printing blanket of a resilient substance and such a proportion of individualized fibers that the surface and its adjacent layer is materially reenforced against compressive and wave strains, and moulding ink-retaining depression in the face of the blanket as it is being vulcanized or cured.

I claim:

1. The process of manufacturing a printer's blanket which includes raising a nap upon a textile reenforcing ply of said blanket, impregnating the ply with a liquid mixture capable of conversion into a resilient substance when dried, applying the ply nap-side outwards to a printer's blanket base and curing the blanket against a foraminous layer to form permanent indentations in the working surface of said blanket.

2. The process of manufacturing a printer's blanket which includes raising a nap upon a textile reenforcing ply of said blanket, impregnating the ply with rubber latex, applying the ply to a printer's blanket base and vulcanizing the blanket against a foraminous layer to form permanent indentations in the working surface of said blanket.

3. A printer's blanket comprising a matrix of resilient material and having substantially uniformly distributed throughout its working surface a multiplicity of indentations providing storage reservoirs for excess ink, the walls of the indentations containing individualized organic fibres in quantity sufficient to strengthen them against collapse under printing pressure.

4. A printer's blanket comprising a matrix of resilient material reinforced by a layer of napped textile material and having substantially uniformly distributed throughout its working surface a multiplicity of indentations providing storage reservoirs for excess ink, the walls of the indentations containing the individualized fibres of said napped textile layer in quantity sufficient to strengthen said walls against collapse under printing pressure.

5. A printer's blanket comprising a matrix of resilient material having individualized organic fibres incorporated therein and having substantially uniformly distributed throughout its working surface a multiplicity of indentations providing storage reservoirs for excess ink, the walls of the indentations containing the individualized fibres in quantity sufficient to strengthen them against collapse under printing pressure.

6. A printer's blanket comprising a matrix of rubber and having substantially uniformly distributed throughout its working surface a multiplicity of indentations providing storage reservoirs for excess ink, the walls of the indentations containing individualized organic fibres in quantity sufficient to strengthen them against collapse under printing pressure.

STEPHEN B. NEILEY.