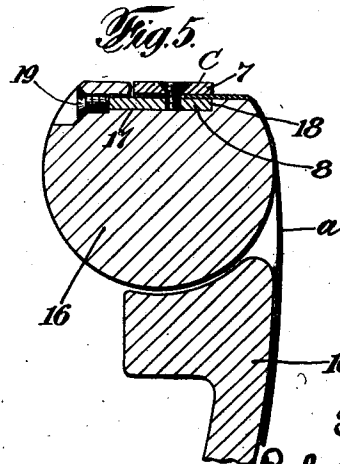
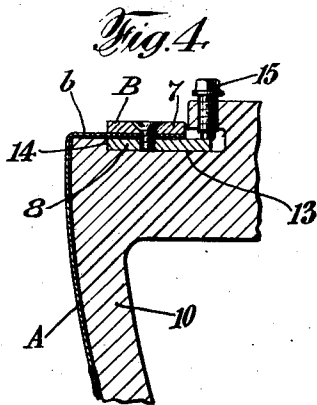


March 30, 1926.

1,578,736

R. JOHN
BLANKET FOR PRINTING PRESSES, PROCESS FOR FORMING
THE SAME, AND PROCESS OF PRINTING EMPLOYING SAME
Filed Jan. 26, 1925 2 Sheets-Sheet 1



Inventor
Robert John
By his Attorneys
Pindle Bright Keel & Bean

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Fig. 6.

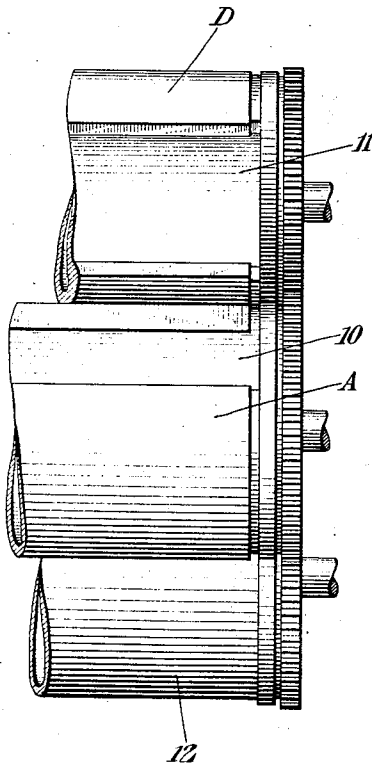
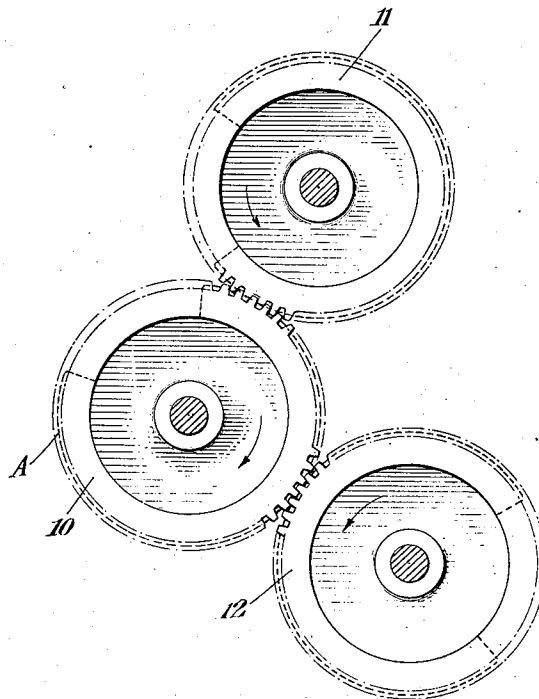


Fig. 7.



Inventor
Robert John
By his Attorneys
Prindle, Wright, Neal & Bean

UNITED STATES PATENT OFFICE.

ROBERT JOHN, OF NEW YORK, N. Y.

BLANKET FOR PRINTING PRESSES, PROCESS FOR FORMING THE SAME, AND PROCESS OF PRINTING EMPLOYING SAME.

Application filed January 26, 1925. Serial No. 4,646.

To all whom it may concern:

Be it known that I, ROBERT JOHN, a citizen of the United States, a resident of New York, in the county of New York and State of New York, have invented a certain new and useful Blanket for Printing Presses, Processes for Forming the Same, and Processes of Printing Employing Same, of which the following is a specification.

My invention relates to blankets for printing presses of all kinds, and particularly to blankets such as are used on the well-known offset press, and has for its objects, among others, the improvement of the printing produced by such blankets and presses, and the reduction or elimination of the wear and tear between the blanket plate and paper of present day presses. My invention comprises, not only the blanket itself and the process of forming it, but includes as well a new means of fastening the blankets to, or mounting them upon, a press and a process of printing, utilizing said new blanket and said new means of fastening or mounting, whereby certain novel and beneficial results are attained. To such ends, my invention consists in blankets for printing presses and the process of making said blankets, means for fastening said blankets upon a press, and the process of printing hereinafter specified.

In the accompanying drawings,

Fig. 1 is a plan view of a blanket embodying my invention, a portion of said blanket being skived off or shaved to clearly show the layers of which it is composed;

Fig. 2 is an edge view of Fig. 1;

Fig. 3 is a view of a blanket embodying my invention and having clamps at its ends by which it may be fastened to the press;

Figures 4 and 5 are cross-sectional views, respectively, showing the portions of a press cylinder by which the clamps at the ends of the blanket in Fig. 3 are secured to the cylinder, and the blanket drawn about the cylinder to the desired easy firmness;

Fig. 6 is an elevation view showing the plate, blanket, and impression cylinders of an offset press, and the gearing for driving them;

Fig. 7 is an end view of Fig. 6.

My invention is capable of embodiment in many different forms, and, while I have chosen for the purpose of illustration the best embodiment thereof known to me, such embodiment is to be regarded only as typical and my invention is not to be confined thereto.

By way of explanation, I may state that, in the present practice of printing, the blanket, which may consist of rubber or other compressible material, is stretched tautly around the cylinder, or over the platen to which it is fastened, one of the functions of such blanket being to equalize inequalities between the printing plate and paper, or other inequalities which may exist in the cylinders, or platen, or in the press itself. In direct printing presses, such as those designed to print directly on paper from type, half tone engravings or lithographic stones or plates, the blanket is fastened to the impression cylinder and the paper is fed between it and the plate or type-bearing member. In offset presses, however, the blanket itself comes in contact with the plate or type member, from which it receives an ink impression, which ink impression it transfers to paper fed between it and a separate impression cylinder. In this latter type of press the blanket, in addition to equalizing inequalities, has the function of receiving and discharging the ink impression.

The printers' blankets of the prior art have a compressible ink or color-receiving face, but as such face has always been supported upon a stretchable base, the compressibility of the surface material has been reduced by the stretching of the base in securing it around a cylinder or over a platen. This has reduced the ability of the blanket to take up the inequalities existing between the press and the plate and the paper, and has necessitated the use of such an amount of pressure or "squeeze" as to cause wear on the plate and to prevent the use of papers of such composition that their surfaces tend to "pick" or lift when printed under excessive pressure or "squeeze".

In the case of any blanket which is firmly fastened to the press, wear occurs with

each impression between the blanket and the plate, since the blanket, being designed through compressibility to take up inequalities, must be used in a state of compression in order to function. Since a state of compression must therefore exist, a rubbing or frictional effect must take place with each impression if either the blanket, or the plate, or both, are fastened to a cylinder, because compression can only be effected in such a case by increasing the diameter of one or both cylinders beyond the point where, when compressed, the surface of the plate and the blanket would meet in a theoretical line of contact. It is this increase in diameter which gives rise to the rapid wear of plates and in a great measure to so-called gear-streaks in present day offset printing. Moreover, in the case of blankets in offset presses, the reduced degree of compressibility which is due to the stretching of the base that supports the ink-receiving face, reduces the ability to receive and discharge the ink impression completely and readily.

My invention overcomes these serious objections, and it comprises a compressible paper-supporting, or ink or color-receiving face, and means for so securing it to the part of the press which carries it that its compressibility shall be free and unrestrained. In its highest form particularly on an offset press, it also possesses the quality of having freedom bodily so to adjust itself parallel to the surface or part of the press which carries the paper or color or ink, as not to cause wear on the surface of either the blanket or the printing plate. These functions may be accomplished in many different ways and by various constructions.

The example chosen for illustration is designed for use on a litho offset printing press.

My invention, however, is not limited to offset printing presses, but is applicable to all types of presses using a blanket.

As one means of retaining the full compressibility of a blanket while yet securely fastening it to a press, I may take a rubber facing and secure it to a non-stretchable back or base, which latter may be secured to the press. As a convenient way of doing this, I first make or procure a rubber blanket such as is used in the present art. Such a blanket consists of one or more layers of fabric, frictioned or impregnated with rubber, on the upper surface of which a rubber coating has been applied and affixed as by vulcanizing. In the illustrative embodiment of my invention shown in the drawings, the blanket consists of two sheets of fabric 1 and 2 respectively, having layers of rubber 3 and 4 which have been formed on the fabric by frictioning or impregnating or otherwise forming or attaching thereto. Assuming

that such a blanket, as made or procured, presents a total thickness of, say, .065 of an inch and that to meet the requirements of a given standard press, the total thickness of the finished blanket should be .089 of an inch, I next procure the following materials:

1. A sheet of celluloid or pyroxalin or other nitrocellulose product having a thickness, say, of approximately .005 of an inch;

2. A sheet of rolled zinc, aluminum, iron, copper or other flexible metal, having a thickness of approximately .019 of an inch.

Laying my blanket on a smooth surface, with the fabric side uppermost, I next proceed to impregnate the sheet of fabric 1 with nitrocellulose as by applying to it a solution of pyroxalin, 5 parts; alcohol, 47½ parts; ether, 47½ parts. I apply this solution by rubbing it into the fabric with a rag, repeating the operation two or three times or until it appears that the fabric side of the blanket is well impregnated with nitrocellulose.

Having permitted the solvent to evaporate, I next flood the blanket, still fabric side uppermost, with a suitable quick-acting solvent for nitrocellulose as wood alcohol, immediately thereafter bringing the sheet of celluloid 5, above referred to, into intimate contact with the said fabric side of the blanket (the side opposite to the one having the rubber on it) as by rolling or squeegeeing. By this means I find that the solvent with which the fabric side of the blanket has been flooded tends to dissolve both the sheet of celluloid and the nitrocellulose content of the fabric and that by the rolling or squeegeeing firm adhesion is secured, the flood of solvent affecting only the lower side of the celluloid sheet and the pressure forcing it into intimate contact with the fabric.

Next, taking the sheet 6 of rolled metal, I preferably produce on it a fine grain as by sand blasting or shaking under marbles and flint mud. Having thus grained the metal and washed it free from loose particles of metal and grit, I next flood it with a solvent for nitrocellulose, as wood alcohol, quickly bringing the celluloid side of the rubber blanket, previously described, into intimate contact therewith as by rolling or squeegeeing. The result of this operation is to firmly fasten the sheet of nitrocellulose to the metal plate. When the solvent or solvents employed have been evaporated, the resultant article consists of an upper layer of rubber 4 firmly fastened to a layer of fabric 2, which in turn is firmly fastened to a layer of rubber 3 that is fastened to the fabric 1, and this latter fabric is secured to the sheet of nitrocellulose 5, which in turn is firmly fastened to a metallic base 6, the thickness of the whole being .089 of an inch as desired. The tenacity of affixation is such as to preclude the possibility of any layer becoming detached from another layer through use as

a blanket on a printing press. After the operation has been properly performed, I find it virtually impossible to separate either layer from the other without destroying the layers so separated.

Having prepared my printing blanket, as just described, I next preferably attach to it the usual clamps or end pieces designed to hold it on the printing press. These clamps, as shown in Fig. 3, may consist of an upper metal strip 7 and a wider lower metal strip 8, between which the blanket is clamped, as by the screws 9. My blanket is now ready for mounting upon a press.

If my blanket is designed to merely replace one of the tautly stretched blankets on a cylinder press of the present art, it is firmly secured to the press by the stretching means provided thereon. Used in this way, no matter how tightly stretched the metal base may be, the rubber, having been applied without stretching to the base, still retains its full compressibility, or practically so, the stretching qualities of any of the metals described being so slight as to have little or no effect on the compressibility of the rubber.

As the compressibility of my blanket is not reduced through stretching of the base upon which it is supported, my blanket adapts itself to the inequalities existing between press, plate, and paper with much less pressure than the ordinary blanket requires, and thus the plate is saved from the wear which comes when an excessive pressure is used. Also, papers can be used of such composition that their surfaces would tend to "pick" or lift when used with the excessive pressures ordinarily required.

If, however, it is desired to apply my new blanket to the fullest advantage, I find that this may be accomplished by securing it comparatively loosely or movably on the cylinder. In order to accomplish this result all that is necessary to do is to leave a slight play in the fastening of the forward end of the blanket and a considerable play in the fastening of its rearward end. By "forward" I mean that part of the blanket cylinder which first comes in contact with the plate cylinder. By "rearward" I mean the portion of the blanket cylinder which is last to receive the impression.

In the illustrated embodiment of my invention, I have shown the blanket as provided with the usual forward and rearward clamps B and C, respectively, at its ends, by which it may be fastened to a press. These clamps consist of upper and lower strips 7 which are secured together as by screws passing through the strips and the interposed edge of the blanket. In order to illustrate the application of the blanket to an offset press, I have shown in Figures 6 and 7 the blanket cylinder 10 of such a

press, which carries the blanket A, the blanket cylinder being geared at the upper side to the plate cylinder 11, to which the ink is applied, and which transfers its impression to the blanket. At its lower side, the blanket cylinder is geared to its impression cylinder 12 between which and the blanket cylinder the paper is fed so that the impression is transferred to the paper. The cylinders travel in the direction shown by the arrows.

To fasten the blanket to the blanket cylinder, a seat 13 is provided for the lower strip 8 of the clamp, in which the said strip bears against a shoulder 14 that resists the pull of the blanket, the plate being held down on its seat by a set screw 15. To fasten the rear end of the blanket, a roller 16 is journaled in a recess in the blanket cylinder 10, and provided with the usual pawl-and-ratchet (not shown) for holding it against any pull of the blanket. The roller 16 is provided with a seat 17 for the lower strip 8 of the rear clamp C of the blanket, and has a shoulder 18 against which the edge of said strip 8 rests, being forced against it by a screw 19. The metal plate 6 of the blanket terminates a sufficient distance short of the rear clamp C so as to leave a free portion of the blanket *a* that can adapt itself to the curvature of the roller 16, and that will permit easy rearward movement of the blanket by buckling or bending, even though very slightly, when the action of the press tends to move the blanket to the rearward. The blanket is also free to move forward, owing to the fact that the portion *b* of the blanket (Fig. 4) being radially positioned, may easily bend to permit such movement.

Having fastened the blanket to the blanket cylinder, as described, I next build up under the plate on the plate cylinder with packing, such as paper, in such a manner as to increase, slightly, the diameter of the plate cylinder over that of the blanket cylinder. By doing so the plate surface, in printing, is driven at a slightly greater speed than the blanket surface, with the result that the blanket travels forward during the impression period, and in so traveling avoids and eliminates the rub or friction characteristic of tightly affixed blankets printed from tightly affixed plates. The amount of said travel may be almost microscopic. I prefer, in fact, to increase my plate cylinder diameter to such an extent only that the forward travel of the blanket is hardly more than .001 of an inch. Indeed, the slightest travel, even though barely perceptible, is sufficient to eliminate rubbing and consequent wear.

While the blanket tightening roller 16 is turned so as to draw the blanket smoothly around the blanket cylinder, the tension thus

put on the blanket is slight as compared with the tension put on the ordinary blanket, and the printing portion of the blanket is entirely protected from stretching by the sheet metal back.

It will be observed from the foregoing that after the conclusion of the impression period, the forward edge of my blanket will come up for the succeeding impression ahead of its place by as much as its travel has been. I find, however, that the impact of the succeeding impression at the commencement of the contact between the plate and the blanket drives the blanket backward to its original starting point; whence it repeats its forward crawl as on the preceding impression; and that the printed sheets are capable of being reprinted in register of microscopic fineness due to the fact that the blanket starts from the same point at each impression and that its travel is the same for each impression.

In the prior art use of blankets on offset presses, a great deal of time, usually one or more hours, is consumed in repeatedly taking up the stretch which develops in the blanket as it is used, because each time the blanket stretches, the length is increased of the image or impression which the blanket had previously received from the plate, so that the next impression on the blanket from the plate will not register with the preceding one but will blur it. The result is that the blanket must be cleaned of the preceding impressions, and the process of stretching, re-inking, printing, and cleaning, must be continuously repeated until the stretch has all been taken out of the blanket. As the printing portion of my blanket is not stretched, and in fact cannot be stretched, no such adjustment or labor is required, and the cost of time, both of the pressman and of the press itself, is saved by my invention.

The aforesaid necessity of tightening the blankets of the prior art until all the stretch is taken out of them, compels the use of relatively thick and strong fabric in the blankets, which introduces unevennesses and irregularities in the surface of the blanket, and makes it more difficult to get a perfectly even impression. My invention, by eliminating any necessity for stretching the printing portion of the blanket, enables much thinner and more evenly woven fabric to be used in the blanket, so that a more perfectly smooth printing surface is obtained.

In the case of the offset press, the high degree of compressibility which my blanket retains when in use presents a still further advantage; namely, it possesses the ability to receive and discharge its ink impression more completely and more readily than if a tautly stretched, and therefore less compressible, impression receiving and transferring surface on a blanket were employed.

Further, by reason of its full compressibility, the picking and lifting of paper surface which attend the use of tautly stretched blankets, is materially reduced or entirely eliminated.

If my blanket is to be used on the platen type of press, the foregoing application is obviously impossible, the blanket having to be firmly affixed to the platen. In this use the advantage of my invention lies chiefly in the fact of the fully compressible surface, giving a more even impression on the paper, together with less wear on the platen or type and a saving of time in the building up of low spots, commonly known in the printing art as "make ready".

In the foregoing specification, it has been pointed out that my new blanket, whether firmly secured to the press or used movably, effects a saving in the wear of the plate. I point out here that the elimination of friction which my blanket accomplishes also decreases the wear on the blanket at the same time. I further point out that my blanket, being fully compressible, is less readily injured or cut by particles of wood, paper or other materials which accidentally go through the press; and that its life is still further increased by the fact that the rubber itself is not stretched, it being true that many blankets employed in the present way are ruined by the tearing of rubber or fabric due to continual stretching.

Many modifications of my invention can be made without departing therefrom or from the scope of the claims, and my invention is not limited to the particular embodiment chosen for the purpose of illustration.

By the term "substantially unperforated" is meant such continuity or substantial uniformity of the base as will not impair the uniformity of the face of the blanket in action.

The term "means attaching" the rubber or other surface material to the metal backing in the claims is meant to include chemical as well as mechanical means independent of mere adhesion of the rubber or other substance to the surface of the metal plate.

I claim:

1. A printer's blanket comprising a substantially unstretched compressible face, and a substantially unperforated non-stretchable back.

2. A printer's blanket comprising a substantially unstretched elastic face, and a substantially unperforated non-stretchable back.

3. A printer's blanket comprising a rubber-like face, and a substantially unperforated non-stretchable back.

4. A printer's blanket comprising a substantially unstretched rubber-like face, and a substantially unperforated metallic back or base.

5. A printer's blanket comprising a rubber-like face, a fibrous body upon which said face is mounted, and a metallic back or base.
6. A printer's blanket comprising a plastic face, a fibrous body carrying said face, and a metallic back or base.
7. A printer's blanket comprising a plastic face, a fibrous body carrying said face, a metallic back or base, and a nitrocellulose fastening between said fibrous body and said base.
8. A printer's blanket comprising a plastic face, a fibrous body carrying said face, a metallic back or base, and a nitrocellulose fastening between said fibrous body and said base, the surface of said metallic base being roughened.
9. A printer's blanket comprising a substantially unstretched plastic face and a substantially unperforated non-stretchable back for said face.
10. A printer's blanket comprising a plastic face that is not under tension, and a taut substantially unperforated back for said face.
11. A printer's blanket comprising a taut substantially unperforated back or base, and a plastic face whose compressibility is not substantially reduced by the tautness of said base.
12. A printer's blanket having a metallic substantially unperforated base, and a substantially unstretched rubber face secured to said base.
13. A printer's blanket comprising a nitrocellulose back, and a rubber face.
14. A printer's blanket comprising a nitrocellulose back, and a rubber face, a sheet of fibrous material being interposed between said back and face.
15. A printer's blanket comprising a nitrocellulose back, a rubber face, and a metal base secured to said nitrocellulose.
16. A printer's blanket comprising a nitrocellulose back, a rubber face, a sheet of fibrous material being interposed between said back and face, and a metal base secured to said nitrocellulose.
17. The combination with the member of a press for carrying a blanket, of a blanket having a substantially unperforated non-stretchable back that is secured to said member, and a substantially unstretched rubber face secured to said back.
18. The combination of a member of a press for carrying a blanket, having a non-stretchable base loosely secured thereto, and a rubber face secured to said base.
19. The combination of a rotary cylinder, a substantially unperforated non-stretchable base secured to said cylinder, and a substantially unstretched rubber face secured to said base.
20. In a printing press, the combination of a rotary cylinder, a non-stretchable base secured to said cylinder, and a rubber face secured to said base, said base being so secured to said cylinder as to permit movement in the direction of travel of said cylinder.
21. The combination with a rotary cylinder of a metallic base so secured thereto as to permit movement in the direction of travel of the said cylinder, and a rubber face secured to said base.
22. The combination with a rotary cylinder of a metallic base so secured thereto as to permit movement in the direction of travel of the said cylinder, a fibrous body secured to said base, and a rubber face secured to said fibrous body.
23. The combination with a rotary cylinder of a metallic base so secured thereto as to permit movement in the direction of travel of the said cylinder, a body of nitrocellulose secured to said base, a fibrous body secured to said nitrocellulose, and a rubber facing secured to said fibrous body.
24. A printer's blanket comprising a substantially unperforated non-yielding base, and a substantially unstretched compressible face.
25. A printer's blanket comprising a substantially unperforated non-yielding base, and a substantially unstretched rubber face.
26. A printer's blanket comprising a substantially unstretched compressible face, and substantially unperforated means for so securing it to the part of the press which carries it that its compressibility shall be free and unrestrained.
27. A printer's blanket comprising a substantially unstretched compressible face, and substantially unperforated means for so securing it to the part of the press which carries it that its compressibility shall be free and unrestrained, said securing means comprising means permitting the blanket to adjust itself parallel to the surface or part of the press which carries it.
28. The process of printing comprising supporting a rubber faced blanket on a suitable member, bringing said blanket into contact with an inked surface, and permitting said blanket to move relative to said member during the printing operation.
29. The process of printing comprising bringing a rotatable cylinder having a rubber faced blanket thereon into contact with an inked surface, and permitting the said blanket to move relative to said cylinder during the printing operation.
30. The process of printing comprising bringing a cylindrical member having a rubber faced blanket thereon into contact with a cylindrical inked surface, and permitting the said blanket to move relative to said platen during the printing operation.
31. The process of printing comprising

bringing a rubber blanket on a cylindrical support into contact with a cylindrical inked surface, and permitting the blanket to move relative to its support during said operation, and then bringing said blanket into contact with a sheet of paper to transfer said impression thereto.

32. The process of printing comprising bringing a rubber blanket on a cylindrical support into contact with a cylindrical inked surface, permitting the blanket to move relative to its support during said operation, and then bringing said blanket into contact with a sheet of paper to transfer said impression thereto while mounted upon a cylindrical support.

33. The process of printing comprising bringing a rubber blanket on a cylindrical support into contact with a cylindrical inked surface, permitting the blanket to move relative to its support during said operation, and then bringing said blanket into contact with a sheet of paper to transfer said impression thereto and permitting the blanket to move relative to its support while in contact with said sheet of paper.

34. The process of offset printing comprising printing while maintaining the printing surface of the blanket in unstretched substantially uniformly compressed condition along a line of printing contact.

35. The process of offset printing comprising maintaining the blanket in a taut condition around its cylinder while preventing its printing surface from stretching, said printing surface being maintained in a substantially uniformly compressed condition along a line of printing contact.

36. The process of printing comprising bringing a cylindrical member having a rubber faced blanket thereon into contact with a cylindrical inked surface, moving said cylindrical inked surface at a slightly greater speed than that at which the blanket would move if it moved with the cylinder upon which it is mounted, and permitting said blanket to move relative to said member during the printing operation.

37. In a printing press, the combination of a cylinder, a plate mounted thereon, and another cylinder and a blanket mounted thereon, one of said mounted members being so mounted as to be capable of movement on the surface of its cylinder.

38. In a press, the combination of a member for carrying a plate, a plate mounted thereon, a member for carrying a blanket, a blanket mounted thereon, said blanket having a non-stretchable base, and a rubber face secured to said base, one of said mounted parts being capable of movement on the surface of the member upon which it is mounted.

39. The combination with the rotary cylinder, of an imprinting member having a

non-stretchable base, said base being so secured upon said cylinder so as to permit travel in the direction of said cylinder.

40. The process of printing, comprising supporting an imprinting member on a part having a geometrical surface, bringing said imprinting member into contact with an ink-receiving member that is mounted upon a part having a geometrical surface, and permitting one of said imprinting members to move relative to its supporting part during the printing operation.

41. The process of printing, comprising supporting an imprinting member on a part having a cylindrical surface, bringing said imprinting member into contact with an ink-receiving member that is mounted upon a part having a cylindrical surface, and permitting one of said supported members to move relative to its supporting part during the printing operation.

42. The process of printing, comprising supporting a rubber blanket on a cylindrical part, supporting a plate upon a cylindrical part, bringing said plate and blanket into contact, and permitting one of said supported parts to move relative to its support during said operation, and bringing said blanket into contact with a sheet of paper to transfer said impression thereto.

43. In a printing press, the combination of a cylinder having a rubber blanket mounted thereon, a cylinder having a part mounted thereon adapted to receive ink for printing, one of said mounted parts being so mounted as to be capable of movement on its cylinder in the direction of movement, the construction being such that the inked surface of the other of such mounted parts shall be driven at a slightly greater speed than that of the first-mentioned moving part.

44. In a printing press, the combination of a cylinder having a rubber-faced blanket, so mounted thereon as to be movable in the direction of travel of said cylinder, and a cylinder having a part with an inked surface mounted thereon, moving said cylinders at the same angular speed, and the effective radius of the inked surface being slightly greater than the effective radius of the rubber-faced blanket when compressed to effectuate proper printing.

45. A printer's blanket comprising a substantially unstretched compressible face, a metallic back, and means securely attaching said face to said back substantially throughout the entire surface of said base.

46. A printer's blanket comprising a substantially unstretched elastic face, a metallic back, and means securely attaching said face to said back substantially throughout the entire surface of said base.

47. A printer's blanket comprising a substantially unstretched rubber-like face, a me-

tallic back, and means securely attaching said face to said back substantially throughout the entire surface of said base.

5 48. A printer's blanket comprising a substantially unstretched rubber face, a metallic back or base, and a nitro-cellulose fastening attaching said face to said base.

49. A printer's blanket comprising a sub-

stantially unstretched rubber face, a metallic back or base, and a nitro-cellulose fastening attaching said face to said base substantially throughout the entire area of contact. 10

In testimony that I claim the foregoing, I have hereunto set my hand this 7th day of January, 1925.

ROBERT JOHN.