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A. L. LENGEL

PRECISION LINER AND PROCESS OF MAKING THE SAME

Filed Nov. 22, 1923

Fig. 1.

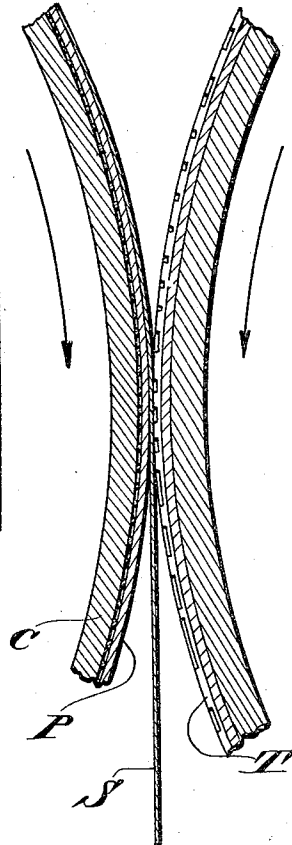


Fig. 2.

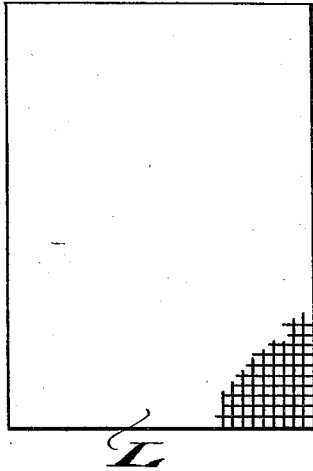


Fig. 4.

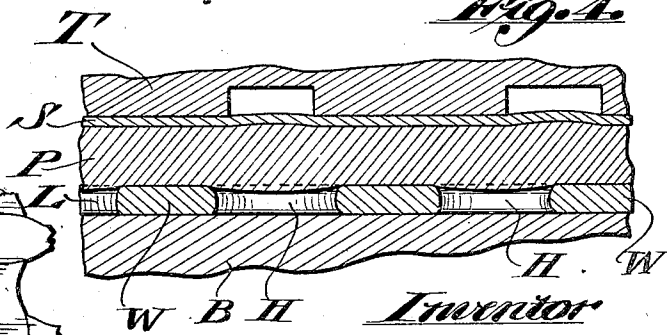
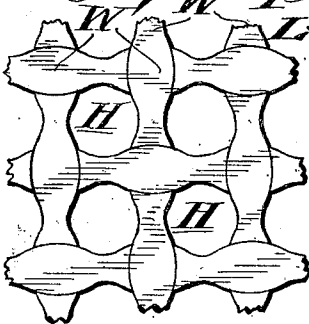


Fig. 3.



Inventor
A. L. Lengel
by Hazardous Miller

Atty's

UNITED STATES PATENT OFFICE.

ALBERT L. LENGEL, OF BAKERSFIELD, CALIFORNIA.

PRECISION LINER AND PROCESS OF MAKING THE SAME.

Application filed November 22, 1923. Serial No. 676,316.

To all whom it may concern:

Be it known that I, ALBERT L. LENGEL, a citizen of the United States, residing at Bakersfield, in the county of Kern and State of California, have invented new and useful Improvements in Precision Liners and Processes of Making the Same, of which the following is a specification.

This invention relates to printing appliances and more particularly to a precision liner.

In printing an impression-member is used and is ordinarily equipped with what is commonly called packings, which may consist of fiber press board, rubber, felt or cork blankets, cloth or any similar texture, and paper liner. These packings decrease in depth or thickness with use, thus losing their precision printing qualities and they must be built up in thousandths of an inch, or new packings substituted in order to maintain a desirable printing plane.

Paper liners are the only known liners at the present time and these are unreliable in thickness, and tend to creep, gather, and pucker under pressure applied in successive movements, and also require considerable time to apply properly and more particularly they are a dead loss when once used and constitute a continual operation hazard.

An object of the present invention is to provide a precision liner having a known and positive replacement depth and which is adapted to bend readily to conform to the smallest cylinder and to be readily applied to a plane; an object is to provide a liner so constructed as to permit the under side of the packing to grip into the liner, thus to eliminate all creeping possibility of the liner; prevent slipping, gathering, and otherwise becoming out of its proper position.

An object is to provide a metallic precision liner having small cavities in the face presented toward the packing so as to obtain an interlock between the packing and the liner when the packing is subjected to pressure.

Other objects and advantages will be made manifest in the following specification of an embodiment of the invention illustrated in the accompanying drawings, wherein:

Fig. 1 is a diagrammatic sectional view

of portions of a cylinder press and showing the liner as applied to the press roller.

Fig. 2 is a diagrammatic plane indicating a sheet of the liner, a portion of which shows on a substantially full-sized square the mesh of the fabrication.

Fig. 3 is a much magnified view indicating the form assumed by the calendered fabric.

Fig. 4 is a much magnified sectional view, showing the effect of a printing form upon a sheet being printed and upon the packing supported by the liner.

The present liner is in the form of a sheet of metal preferably of a fabricated structure, such, for instance, as comparatively fine woven screen. Preferably the wires of which the screen is formed are of a practically perfect dimension and possess a desirable malleable character and of suitable strength. A screen of the desired dimensions is calendered in a suitable calendering machine with the result that the wires of the fabricated material are deformed at the over-lying or intersecting portions to render the entire sheet of a uniform thickness, which is the result of the smoothing out of the over-lapping or crossing wires, preferably to a thickness substantially equal to the diameter of the wire of which the fabric is constructed, thus giving the entire liner a uniform and consistent surface. Obviously, liners of various thicknesses may be made and utilized. These variations including the variation of sizes of wire used in the different liners, so that with a suitable number of the present liners any of the same may be combined to form a base upon which the usual packing body may be laid. Not only may the thickness of the liners vary according to the diameter of the wire, but variations may be made in the pitch or mesh of the fabrication to offer various degrees of resistance as may be determined according to requirements.

These liners may be used to advantage in many instances and are designed for increasing depths of surfaces where precision in adjustment is necessary. An important use for a liner of this character is in the printing industry, especially on large or high-speed rotary presses.

As is shown the liners may be in the form of a flat body L having a desired degree of flexibility so as to be laid around a press

cylinder or roller C, Fig. 1. As above suggested, the liner is preferably of a wire fabrication and in Fig. 2 there is indicated a mesh of preferred proportions. In the manufacture of the liner a fabricated sheet is calendered out or otherwise subjected to pressure so that the crossing portions of the wire may all be so flattened as to produce an inner section approximating the thickness of the wire of which the liners may be fabricated. The result of this flattening or calendering is clearly shown in Fig. 3, where the wires W become broadened at W' at the intersecting portions, the excess material flowing laterally under the pressure. This results in the formation of a liner-body having numerous comparatively small cavities or apertures. In the use of this liner it is applied to the cylinder C or to a press bed B. Upon the applied liner there is laid any suitable packing material P and during the printing process the sheet S is superimposed upon the packing P and subjected to the type-form T. Under printing pressure there is a tendency of the compressed packing material to expand into the cavities or holes H in the fabricated liner L, supported on the cylinder or bed. It will be seen from this that practically all tendency of the liner and the packing body to creep, gather, or otherwise get out of place is overcome, since there is a natural interlocking reaction between the packing P and the supporting band and non-yielding liner L.

It will be seen that I have provided a liner which will form a stable commodity that may be used repeatedly and which will not be readily deformed and the thickness of which will not vary and which does not result in utter waste after a long period of use.

In forming the woven fabric as shown enlarged in Fig. 3, it is subjected to very high calendering or rolling pressure. In order to flatten the strands of wire at their intersections, the pressure must be sufficient to overcome the elastic limit of the metal and cause it to flow or bulge outwardly. In this manner the metal of the fabric spreads at the intersections and is left with substantially its original diameter between the intersections. The fabric is pressed until the thickness at the intersections of the wires is the same as the thickness of the fabric between the intersections.

The fabric formed as above described has considerable rigidity in that the strands do not tend to slip on each other as is sometimes the case with fabrics of round woven wire. I thereby form a wire mesh which may be used for purposes other than as a precision liner for printing presses. I therefore desire to cover the manufacture and use of a wire mesh as described and as claimed within the scope of my claims.

Further embodiments, modifications and variations may be resorted to within the spirit of the invention.

What is claimed is:

1. In combination with a printing press cylinder or press bed, a precision liner on the face thereof, said liner being composed of woven metallic fabric having interstices of substantial size compared with the wire of the fabric, and a packing material laid on said liner but unsecured thereto in such manner as to allow free relative movement between the packing material and the precision liner, the said interstices being of sufficient size to allow the liner to be pressed therein during the printing operation and hence prevent creeping of said packing material.

2. In combination with a printing press cylinder or press bed, a precision liner on the face thereof, said liner being composed of a woven metallic fabric of uniform thickness at and between the intersections of the wire, and a packing material laid on said liner but unsecured thereto in such a manner as to allow slight movement of the packing material, whereby it is pressed into the interstices of the liner and creeping prevented in the printing operation.

3. In combination with a printing press cylinder or a press bed, a precision liner on the face thereof composed of a woven metallic fabric in which the strands of the fabric are pressed flat at their intersections and remain of substantially the original size between the intersections, and a packing material laid on said liner but unsecured thereto, thereby allowing slight relative movement of said packing material on the liner.

4. In combination with a printing press cylinder or a press bed, a foraminated precision liner on the face thereof of a substantially uniform thickness, and a packing material laid on said liner but unsecured thereto, thereby allowing slight relative movement of said packing material on the liner, whereby said packing in the printing operation is pressed slightly into the foraminations and creeping thereof thereby prevented.

5. A metallic precision liner for printing apparatus composed of woven strands, the intersecting portions of said strands being flattened and expanded in width compared with the portions of the strands between the intersections.

6. A metallic precision liner for printing apparatus composed of woven strands, the intersecting portions of said strands being flattened and expanded in width compared with the portions of the strands between the intersections, the fabric so formed being of substantially uniform thickness.

7. A metallic precision liner for printing apparatus composed of woven strands

pressed at their intersections sufficiently to overcome the elastic limit of the original metal, whereby these strands are flattened and spread on each other at their intersections so that the woven fabric is of substantially uniform thickness.

8. A metallic precision liner for printing apparatus composed of woven strands pressed at their intersections sufficiently to overcome the elastic limit of the original metal, whereby these strands are flattened and spread on each other at their intersections so that the woven fabric is of substantially uniform thickness and the strands between the intersections are of substantially their original diameter.

9. The process of making a metallic precision liner for printing apparatus, consist-

ing in subjecting a woven metallic fabric to a calendering or pressing operation in which sufficient pressure is exerted on the fabric to flatten and spread the wires at their intersections.

10. The process of making a metallic precision liner for printing apparatus, consisting in subjecting a woven metallic fabric to a calendering or pressing operation in which sufficient pressure is exerted on the fabric to overcome the elastic limit of the wires at their intersections, thereby flattening and spreading the metal to such extent that the finished fabric is of a substantially uniform thickness.

In testimony whereof I have signed my name to this specification.

ALBERT L. LENGEL.