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METHOD OF PUNCHING OR CUTTING IMPREGNATED FABRICS

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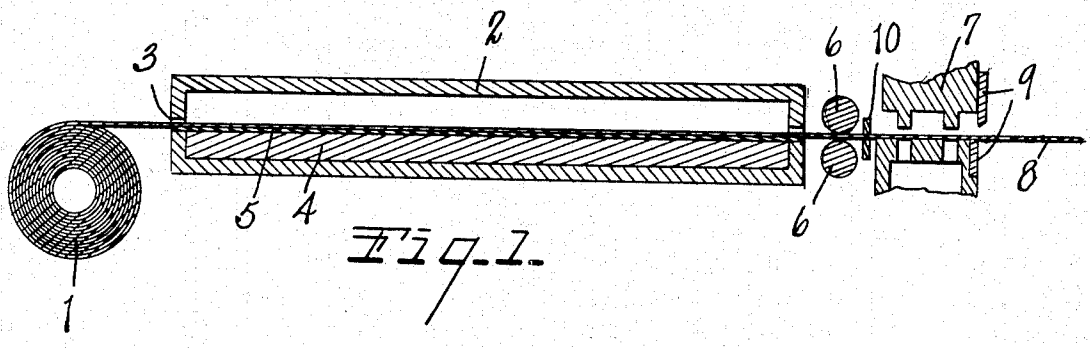


Fig. 1.

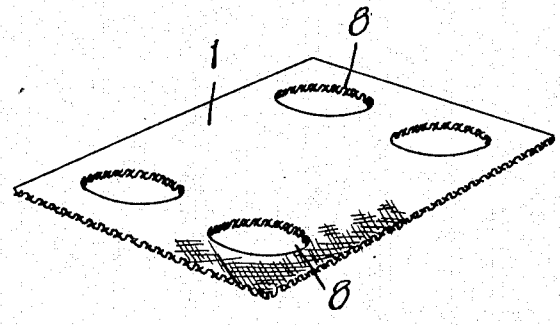


Fig. 2.

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METHOD OF PUNCHING OR CUTTING IMPREGNATED FABRICS

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8 Claims. (Cl. 164—17)

This invention relates to improvements in method of punching or cutting impregnated fabrics.

The main objects of my invention are:

First, to provide a novel method for punching or cutting fabrics or fibrous material.

Second, to provide a method of treating fabrics or other material whereby to facilitate cutting or punching the same satisfactorily.

Further objects relating to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

In the manufacture of various articles, such as shims or gaskets, from flexible fabric material, difficulty is commonly experienced in punching the said fabric due to the slight resistance offered thereby to the punch and the resultant tendency of the same to be dragged by the punch into the die. This causes a rough uneven tearing of the material or raveling of the edges of the cuts, which is not at all satisfactory. My invention deals with a method of treating such a fabric so as to render the same capable of being satisfactorily punched by a conventional punch and die apparatus. My method is of particular value in the case wherein fabrics treated with oil or grease are employed, such as are often utilized in the manufacture of gaskets. However, my invention has merit in a broader sense and deals with the treatment of any flexible material for a subsequent punching or cutting operation.

A structure embodying the features of my invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a diagrammatic view in vertical section illustrating an apparatus for performing the steps of my method.

Fig. 2 is a perspective view illustrating a piece of fabric following the punching and cutting thereof in accordance with the teaching of my invention.

Referring to the drawing, the reference numeral 1 indicates a roll of material which it is desired to cut into sheets and/or perforate, for example, for the purpose of forming shims or gaskets. Such material is ordinarily treated with a suitable oil or grease, such as lanolin or an inferior grade of oil, to weight and seal up the interstices thereof, and my invention broadly consists in subjecting such an impregnated material to freezing temperatures whereby to cause the oil or impregnating agent in the same to congeal and become stiff, whereupon the fabric is well adapted to be punched and/or cut.

To this end the equipment utilized in performing my method may consist of a suitable hollow chamber 2 having slots 3 in the ends thereof to receive the web 1 and having the bottom thereof filled with a suitable refrigerating material 4, such as solid carbon dioxide. In order to provide a suitable support for the web in passing through chamber 2, I may, if desired, provide a pair of guide ways or tracks 5 situated above the refrigerant and adjacent either side of the strip or web 1. It is apparent that in passing through chamber 2 the extremely low temperature of the same is quickly effective to congeal the oil or grease fluid with which the fabric 1 is impregnated, thereby stiffening the fabric so that it may be effectively sheared and punched. It is likewise apparent that the particular nature of the fluid with which the fabric is impregnated is not controlling in my invention and any fluid having a freezing or a solidifying point sufficiently high to be congealed, or practically or partially congealed to a degree sufficient to stiffen and harden the fabric, during the passage of the web through the chamber, is subject to treatment by my method. Moreover, the size or dimensions of the chamber may be readily altered at will and the particular refrigerant employed is also capable of considerable choice. I have found that the cutting and punching of paper, as well as fabrics, treated with lanolin or other agent is facilitated by the procedure herein outlined.

After passing through the chamber, the web is fed by the feed rolls 6 which are synchronized with a punch and die mechanism 7, whereby the holes 8 are punched therein and, if desired, the web may be cut into lengths by the cutter generally indicated 9. If it is desired, a suitable web guide 10 may be interposed between the feeding and punching instrumentalities to assure that the web will be properly led over the die. One of the principal advantages of the foregoing method is the fact that shims can be cut on a conventional automatic press in the same manner as a strip of steel is cut or stamped. Because of the stiffening of the material, it can be fed into a press by automatic feed rolls, which of course are useless for feeding a flexible and soft bodied material.

I have illustrated and described my improvements in an embodiment which is very practical. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A method of cutting and/or punching fabric material, comprising impregnating the material with a suitable congealable material, feeding a web of the material, subjecting the web to a congealing action while being fed, and performing the cutting and/or punching operation thereon while the impregnated web is in congealed condition but not subject to the stiffening action.

2. A method of cutting and/or punching fabric material, comprising impregnating the material with a suitable congealable material, subjecting the web to a congealing action, and performing the cutting and/or punching operation thereon while the impregnated material is in congealed condition but not subject to the stiffening action.

3. The method of treating fibrous strip material to facilitate punching or cutting thereof, comprising impregnating the material with an oily material adapted to be readily congealed, feeding the strip material, and subjecting the same to a congealing temperature during feeding.

4. The method of treating impregnated materials to facilitate punching or cutting thereof, comprising, feeding the impregnated material, and subjecting the same to a chilling temperature during feeding.

5. A step in the process of feeding and cutting an impregnated web, the steps comprising congealing the material with which the web is impregnated prior to cutting the web and then cutting while the web is stiffener by congelation of the impregnating material but not subject to the stiffening action.

6. In a process of operating on an impregnated fabric or like material, the step comprising subjecting the substance with which the web is impregnated to a temperature to stiffen the impregnating substance without otherwise physically affecting the fabric or material.

7. The method of punching or cutting fabric impregnated with an oily or greasy material, comprising subjecting the impregnated fabric to a chilling medium whereby the impregnating material is congealed and the fabric substantially stiffened, and cutting and/or punching the fabric while in such stiffened condition.

8. The method of cutting and/or punching fabric impregnated with oily or greasy material adapted to be congealed, comprising subjecting the impregnated fabric to such temperature as will congeal the impregnating material and substantially stiffen the impregnated fabric, and cutting and/or punching while the fabric is in such stiffened condition.

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