

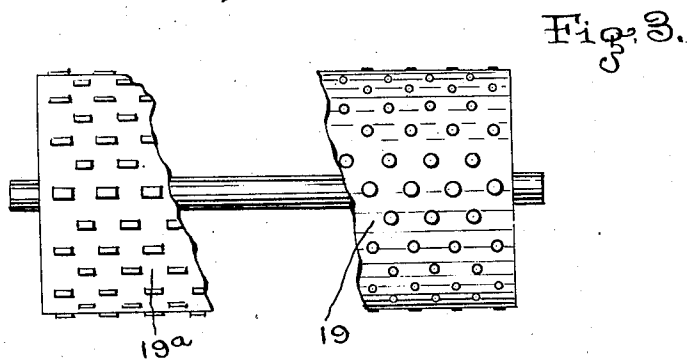
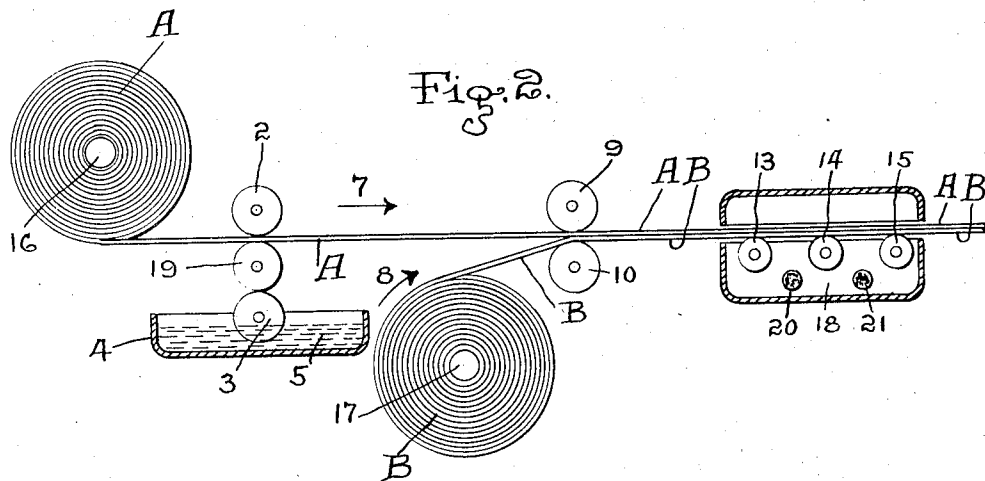
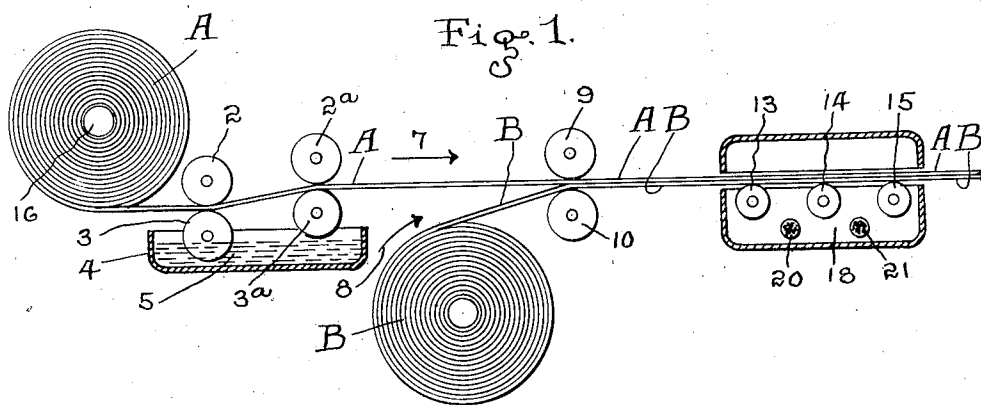
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E. F. WOODWARD

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METHOD OF REENFORCING POROUS PAPER

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INVENTOR

Edgar F. Woodward
Raymond Jones
Attorney

UNITED STATES PATENT OFFICE

EDGAR F. WOODWARD, OF BROOKLYN, NEW YORK, ASSIGNOR TO LEWIS C. VAN RIPER,
OF BROOKLYN, NEW YORK

METHOD OF REENFORCING POROUS PAPER

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This invention relates to reenforced porous paper and method of making same, and provides a paper which will retain its porosity and still be strong enough for use where a strong tough paper that is pervious to air is required such as may be used for dust filter bags for use on pneumatic cleaners. Another object is to provide a strong material of low cost for use in the manufacture of dust filters that is pervious to air and will retain dust and refuse. Other objects will appear from the specifications and drawings herewith.

To these ends the invention consists of the construction and arrangements of mechanism for the reenforcement of porous paper set forth and illustrated in the accompanying drawings in which:

Fig. 1 is a view in side elevation partly in section showing a mechanism employed in practicing my invention with the driving mechanism such as motors, chains, belts and gears eliminated to more clearly illustrate the operation. Fig. 2 is a side elevational view, partly in section of a modified form of same and, Fig. 3 is an enlarged plan view of a modified form of the gumming roller.

Similar characters of reference denote like parts in the various figures.

Fig. 1 is a view partly in section, of an operating plant arranged to carry out the reenforcement method described in which A is a roll of clothlike material, such as cheese-cloth, B is a roll of porous paper, 2 and 3 are preferably rubber rollers between which the clothlike fabric is passed, 4 is a receptacle with the end cut away to more clearly show its operation. It is filled with an adhesive or gum in solution 5, such as is usually used in making envelopes and the rollers 2 and 3 are placed in relation to each other in a similar manner to those of the well known clothes wringer, so that they may be adjusted as desired to squeeze the fabric to regulate the quantity of adhesive or gum which will be retained by the fabric after passing between the rollers. The lower or gumming roller 3, is partly submerged in the adhesive or gum and the upper roller 2 may be adjusted to squeeze the surplus gum,

mucilage or other adhesive in solution out of the fabric. The fabric used must be of loosely woven netlike material such as cheese-cloth or tobacco cloth, so that when attached to the paper, after the surplus adhesive has been squeezed out, it will only close the pores in the paper where the strands of cloth come into contact with said paper and the adhesive allowed to remain in the cloth will only be of sufficient quantity to cause said strands to become attached to the paper, but not sufficient to spread over the paper where not in contact with the netlike strands of fabric. Thus the porosity of the paper will not be entirely destroyed and in fact almost any degree of porosity may be retained by using fabric of a larger mesh.

The rollers 2a and 3a (Fig. 1) are also provided for the purpose of further squeezing any surplus solution out of the fabric and are arranged to be adjusted in relation to each other in a similar manner to the rollers 2 and 3. These rollers may be eliminated if desired.

Both the clothlike fabric and paper are caused to move synchronously in the direction shown by the arrows 7—8 and pass between the steel rollers 9 and 10 which are arranged to exert comparatively great pressure against the fabric and paper, thus forcing them very tightly together so that they practically become one solid piece of reenforced porous paper A—B which is then run through an oven or other compartment upon rollers 13—14—15 and thoroughly dried.

The rolls of clothlike fabric and porous paper are respectively carried upon shafts 16 and 17 which in turn are provided with bearings and the rollers 9 and 10 are preferably connected to driving means such as motor power to carry the paper and cloth-like fabric through. After passing through the oven in which 20—21 are heating coils, or other hot air chamber, the reenforced porous paper A—B may be used in the making of dust collectors, dust bags or for any purpose for which a strong porous, inexpensive material is desired.

A modified form of the gumming roller is shown in Fig. 3, wherein the gumming roller

is provided with projecting teeth or pins, separated from each other, so that the entire surface of the clothlike fabric is not coated with the adhesive, but only dot, (19) dash shaped- (19^a) or other shaped coatings of gum are put on in predetermined spaced positions, thus leaving the spaces between the dots, dashes or other gummed designs free of gum or other adhesive.

10 In Fig. 2 I have shown a modified form of reenforcing plant in which the gumming roller 3 is arranged to supply gum to a supplemental gumming roller 19—19^a shown in Fig. 3 which in turn supplies gum to the fabric, but only in predetermined spaced positions, so that the entire surface of the fabric is not coated, but portions are left free of the adhesive.

20 The method of attaching cloth to paper by means of an adhesive is not new, but heretofore it has been done only for the purpose of strengthening paper for use in the arts and for wrapping etc., and by all the well known processes the adhesive used would close the pores in paper if it were of a porous nature such as I use in my present process. In no instance, so far as I am aware, has reenforced porous paper been prepared in such a way that it remained porous after being reenforced by a clothlike fabric until my invention thereof, and it is essential that it remain sufficiently porous to allow air to pass through freely when used for a dust bag or filter adapted for use on pneumatic cleaners.

35 I claim:

1. The method of producing a reenforced porous paper, which comprises feeding from rolls sheets of porous paper and net-like fabric respectively, applying an adhesive to said fabric and removing excess adhesive, thereby leaving the meshes of the fabric free of adhesive, pressing said fabric sheet into face contact with said porous paper and drying the unitary sheet, whereby the porosity of said paper is substantially undiminished.

45 2. The method of reenforcing porous paper which comprises feeding from rolls sheets of said porous paper and a net-like fabric respectively, passing said net-like fabric in contact with a roller carrying an adhesive, then squeezing said net-like fabric to remove surplus adhesive therefrom, so that said adhesive will not spread over said porous paper between the strands of said net-like fabric, applying said fabric in face to face contact with said porous paper, and pressing same together, then drying the paper and fabric, whereby the porosity of said paper will be substantially undiminished.

60 EDGAR F. WOODWARD.