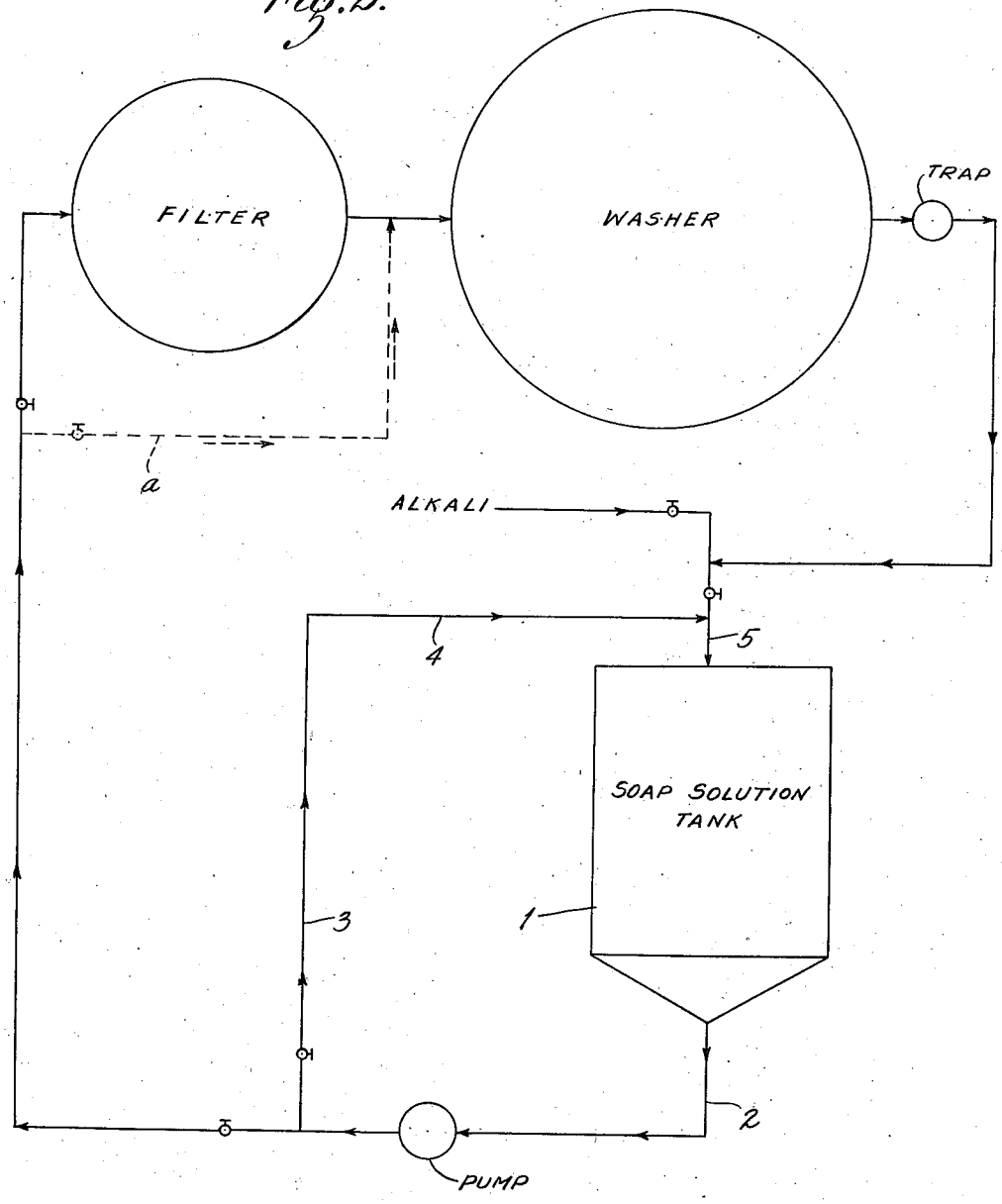
Oct. 3, 1939. T. M. LANGAN ET AL 2,174,793

METHOD OF CLEANING GARMENTS

Filed Nov. 1, 1937 2 Sheets-Sheet 2

Fig. 2.




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Patented Oct. 3, 1939 2,174,793

# UNITED STATES PATENT OFFICE

2,174,793

## METHOD OF CLEANING GARMENTS

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Application November 1, 1937, Serial No. 172,070

5 Claims. (Cl. 8—142)

Our invention has relation to improvements in methods of dry cleaning garments or other fabric articles, and it consists in the novel features hereinafter set forth in the specification and pointed out in the claims.

The principal object of the invention is to maintain the proper percentage of neutralization of the soap in the dry cleaning solution for a given quantity of clothes cleaned, and thereby effect great economies in the cleaning materials used and increasing the efficiency of the clothes cleaning operations. The manner of accomplishing this object, together with the other advantages inherent in our improved method, will be better appreciated from a brief description of the processes now employed in the dry cleaning industry.

It was formerly common practice in the dry cleaning industry to use a minimum amount of soap in the cleaning solution and to discard the soap bath after each load of garments cleaned. A few years ago many of the dry cleaners adopted the practice of using a strong soap solution (now generally referred to in the industry as S. S. S.) in which there was 3% to 10% of soap by volume, and which solution was used on more than one run of garments. The strong soap solution method is very effective in the removal of both spots and stains and ordinary insoluble soil, but it is difficult to maintain an efficient and satisfactory condition because of the acid condition of the soil within the garments.

Most dry cleaning soaps, and particularly those suitable for use in a strong soap solution method of cleaning, are super-fatted; that is, there is an excess of fatty acid beyond that necessary to effect complete neutralization of the alkali in the soap (this excess of fatty acid is considered desirable because it facilitates solution or dispersion of the soap in the dry cleaning solvent, whereas completely saponified soaps usually require an auxiliary agent, such as an alcohol, to effect proper dispersion or solution in the solvent). Then too, the acid content of the bath is increased by the garment soil which is almost always of an acid nature since it consists principally of inert material, perspiration, body oils, and sulfur gases from the atmosphere, especially in the case of garments worn in the city. This acid soil breaks down the soap and after a few loads of garments have been cleaned, the efficiency of the soap bath drops off rapidly, giving poorer and poorer cleaning results as each succeeding load of garments is cleaned. Therefore, in first class cleaning plants, it has become the custom to discard the soap bath after relatively few loads of garments have been cleaned in it. The losses introduced by this uneconomical practice have been somewhat reduced by attempts to maintain the soap solution at the required strength by the addition of small quantities of fresh soap to the bath with each load of garments cleaned. However, this practice is not entirely satisfactory, as will be pointed out later.

It is a matter of common knowledge in the clothes cleaning industry that the acid soil in the garments breaks down the soap, and a patent has been granted to Ralph A. Morgen, No. 1,979,399, disclosing the use in dry cleaning of an alkaline soap solution (called a detergent by the patentee), which soap solution or detergent contains sufficient free alkali to neutralize the acidity transferred to the solvent from the garments being cleaned. However, this process is applicable only in the cleaning of a single batch of garments, as the coap is immediately removed from the dry cleaning solvent after the cleaning operation by means of a clarifying powder. The real action of the acid soil on a strong soap solution does not seem to be clearly understood in the art.

We have found, after several years of study and experimentation, that the principal action of the soil on the soap is the removal of the alkali from the soap and the decrease of the degree of neutralization of the soap below its original condition. This decrease in the degree of neutralization (which is the equivalent of increasing the super-fatting) has a very marked effect on the cleaning qualities of a dry cleaning soap bath. Particularly is this true when the percentage of neutralization drops below a more or less critical point, which varies with the type of soap being used. As the neutralization falls below this critical point, the efficiency of the strong soap solution decreases rapidly.

Therefore, when a succession of clothes batches are cleaned with the same dry cleaning soap bath, the addition of small amounts of 70% neutralized dry cleaning soap will but slightly increase the percentage of neutralization of a bath containing a large amount of soap which has dropped to 40% neutralization.

We have discovered that if, instead of attempting to maintain the effective soap content of the bath by the addition of small amounts of soap with each bath of clothes cleaned, an alkali is added directly to the bath to compensate for the increase in the acid content of the bah, the cleaning efficiency of the bath will be maintained very considerably. Of course, the quantity of this al-

When this practice is followed, the soap solution, after the addition of the alkali, is circulated from the tank 1 through the pipes 2, 3, 4 and 5 in a closed circuit for a sufficient length of time to effect thorough agitation to enable the soap solution to completely take up the added alkali. When this has been accomplished, the valves are manipulated so as to cause the soap solution to circulate through the washer and the balance of the system.

However, if a weak alkali, such as ammonia, is used in the intermittent process, it is not necessary to agitate the alkali separately.

When the practise of continuously adding the alkali is followed, the valves may be regulated so as to allow the alkali to circulate with the soap solution through the clothes cleaning circuit without the necessity of independent agitation of the alkali with the cleaning fluid.

Having described our invention, we claim:

1. In the process of dry cleaning acid soiled garments including application to the soiled garments, or other articles to be cleaned, of a non-aqueous solvent and a soap, the step of reconditioning the used soap solution by adding thereto an alkali in sufficient quantity to compensate for the addition to the soap solution of the acid soil extracted from the garments.

2. In the process of dry cleaning acid soiled garments including application to the soiled garments, or other articles to be cleaned, of a non-aqueous solvent and a soap, the step of reconditioning the used soap solution by continuously adding thereto during the cleaning operation an alkali in sufficient quantity to compensate for the addition to the soap solution of the acid soil extracted from the garments.

3. In the process of dry cleaning acid soiled garments including application to the soiled garments, or other articles to be cleaned, of a non-aqueous solvent and a soap, the step of reconditioning the used soap solution by periodically adding an alkali in sufficient quantity to compensate for the addition to the soap solution of the acid soil extracted from the garments.

4. In the process of dry cleaning acid soiled garments including application to the soiled garments, or other articles to be cleaned, of a non-aqueous solvent and a soap, the step of reconditioning the used soap solution by periodically adding an alkali in sufficient quantity to compensate for the addition to the soap solution of the acid soil extracted from the garments, and agitating said alkali with the soap solution while temporarily discontinuing the application of the soap solution to the garments.

5. In the process of dry cleaning acid soiled garments, including application to the soiled garments, or other articles to be cleaned, of a non-aqueous solvent and a soap in a sufficient quantity to produce in excess of a 1% soap solution, the step of adding an alkali in sufficient quantity to neutralize the acid introduced into the soap by the soil from the garments.

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Oct. 3, 1939. R. L. LAY 2,174,794

MOISTURE TRAP FOR DRY PIPES

Filed Jan. 11, 1938

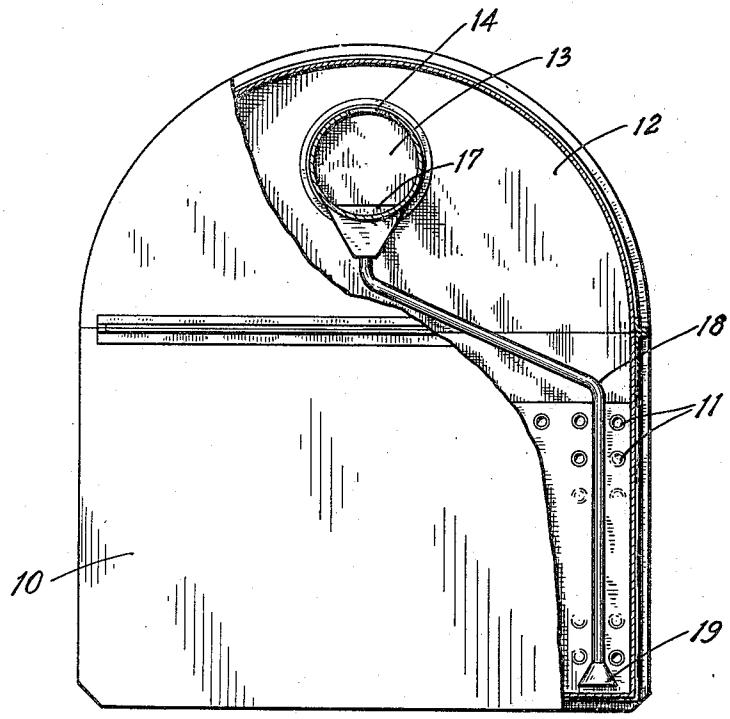



Fig. 1.

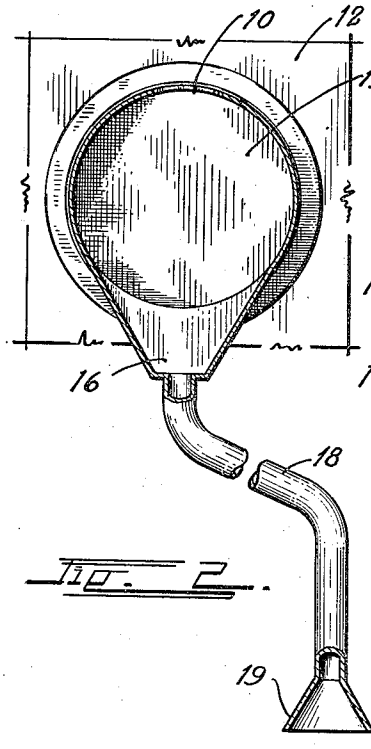



Fig. 2.

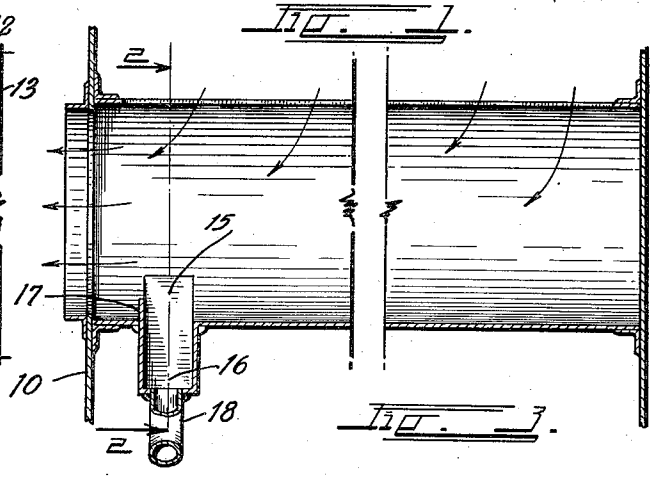



Fig. 3.

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