

April 20, 1937.

W. W. ROWE

2,077,438

COATED CREPED FABRIC AND ARTICLE AND PROCESS OF MAKING IT

Filed July 19, 1934

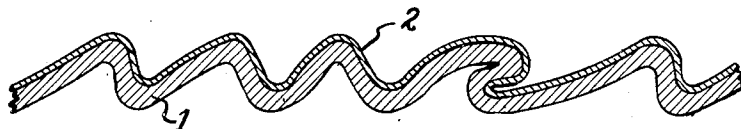


FIG. 1.

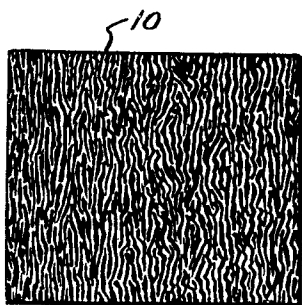


FIG. 2.

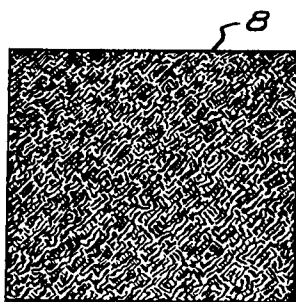


FIG. 3.

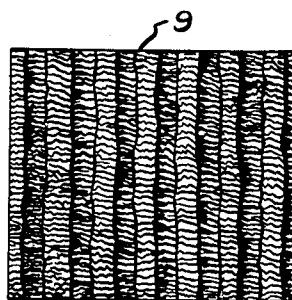


FIG. 4.

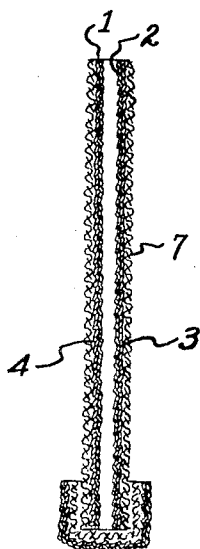


FIG. 5.

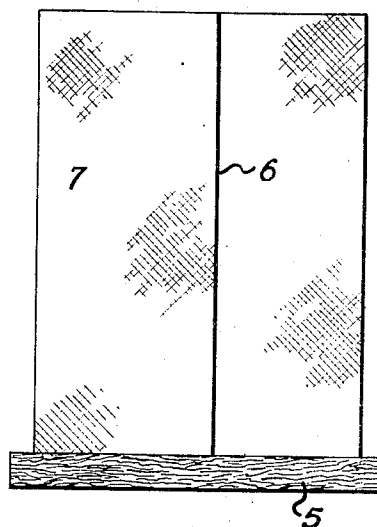


FIG. 6.

INVENTOR.
WILLIAM WALLACE ROWE.

BY

Allen & Allen

ATTORNEYS.

UNITED STATES PATENT OFFICE

2,077,438

COATED CREPED FABRIC AND ARTICLE
AND PROCESS OF MAKING IT

William Wallace Rowe, Cincinnati, Ohio, assignor
to The Paper Service Company, Lockland, Ohio,
a corporation of Ohio

Application July 19, 1934, Serial No. 736,055

11 Claims. (Cl. 154—33)

My invention relates to the production of novel types of creped webs, such as may be used, for example, in bags or other containers, and its fundamental objects may be classified as follows:

(a) The provision of creped webs of superior proofness as respects such influences as moisture, heat, gases and the like.

(b) The provision of webs which are superior from the standpoint of appearance, sanitation and the like.

(c) The provision of webs which have superior physical qualities from the standpoint of stretchability, distortion without disruption, etc., and

(d) The provision of a process whereby such products are made available.

These general objects are inter-related as will be hereinafter set forth; and I accomplish these objects and other more specific objects which will be set forth hereinafter, or will be apparent to one skilled in the art upon reading these specifications, in those certain constructions and by those series of process steps of which I shall describe in detail certain exemplary embodiments. For a better understanding of the ensuing description, reference may be made to the accompanying drawing, in which:

Figure 1 is a sectional view on an exaggerated scale, of an exemplary product embodying my invention, and

Figure 2 is a face view of an exemplary single creped product embodying my invention.

Figure 3 is a face view of an exemplary double creped product embodying my invention.

Figure 4 is a face view of a creped and corrugated product.

Figure 5 is a sectional view of a bag embodying my invention.

Figure 6 is a plan view thereof.

As is well known, creping as ordinarily practiced, comprises crowding a web back on itself, whereby to crinkle it. This is done by causing the web to cling to a creping surface, usually a revolving cylinder, and moving said surface and a knife or doctor blade relatively to each other.

In general, my present invention involves the provision of coated creped sheets of a type hereinafter to be more fully described. It is difficult, however, to coat an already creped paper, by reason largely of the nature of its surface and the fact that a successful attempt to get the coating substance well down into the valleys of the crinkles, is almost invariably accompanied by the removal of great quantities of the resident stretch in the web. Moreover, the application of a softened coating to a web of this character results in

sticking together the adjacent crinkles, and therefore, for certain uses, it adversely affects the remaining stretchability. Particularly if the coating is one which becomes hard or brittle under temperatures to be expected in use, the stretchability for the said uses is still more adversely affected; and when the sheet is stretched, the coating and/or the sheet is disrupted and the proofed character of the web may be destroyed. Again, when a previously creped paper is coated with certain films there is a tendency for the film to craze or crack in use. This is perhaps due to expansion and contraction. This tendency is minimized in my new products.

It has hitherto been proposed, as in my reissue application, Re. No. 17,633, to crepe a web by means of the positive adhesive action of a thermoplastic substance. In this process the difficulties of coating an already creped web are eliminated and the product is delivered with a coating of the thermoplastic substance, and a desired amount of resident stretchability. The thermoplastic substance being soft, however, may be displaced or extended to some extent by the creping operation and in any event tends to bridge across the crinkles of the crepe; and while the product so produced and the process of making it are extremely useful and have come into wide commercial application, yet my present invention is directed to a process and product in which the crinkled web has a continuous and flexible proofing coating, not tying across the crinkles as aforesaid, remaining of a substantially constant thickness in the finished product, and not liable to disruption in use.

The difficulties aforesaid can be overcome according to my present discovery if the web is coated with a film of coating material which is dried and set before creping, corrugating or the like, and which is not adhesive to itself at the temperatures of creping, and/or drying operations, and/or the temperatures of use. Briefly therefore, in the practice of my invention, I coat the web prior to a deforming operation, with a film of coating substance which is then caused to set up to a non-tacky condition. Having done this the paper is then deformed as desired. Among the many coating substances which I may employ are the various cellulosic compounds, lacquers, varnishes, coatings of oxidizable oils such as tung oil or China wood oil, with or without other substances, and the various condensation resins.

The operation of crinkling is one which results in a severe creasing of the web, as a consequence

of which these various coatings should have the qualities of flexibility and deformation, or bending, without disruption, to the degree required. When creped paper is stretched, the creases in the film coating must also unfold with the paper, and without injury to either the paper or the film. In the use of the coating substances which I have named, this quality may be secured if not already present therein, by the use of so-called plasticizing agents known to the art, and an especial discussion of them is not necessary.

An important point of my invention is that such coatings should in the first place be applied before the deforming operation, because (a) of the difficulty of coating deformed or creped sheets discussed above, and (b) of the sticking together of the crinkles or rugosities in the deformed sheets, as well as (c) of the appearance factor which will be taken up hereinafter. But if such coatings are so applied they must in the second place be substantially non-adhesive to themselves at the creping point, so as not to stick the rugosities together, when they are crowded together at the creping knife, and this quality of the coatings must be sufficient to prevent such action also throughout such after treatments as may be applied to the web, for example corrugating, additional creping, the processes of manufacture in making bags or other articles out of such webs; the pressure of baling operations, and the conditions of temperature and the like to which the articles or fabric will be subjected in use. This requirement is especially important in papers having crushed corrugations therein, since there is an even greater tendency for the flat pleats to be stuck together. The conjunction of these two requirements constitutes a radical departure from the art and enables me to produce products having qualities hitherto not attained.

In Figure 1, I have shown my product in cross-section as comprising a layer 1 of paper or other web material in crinkled condition, and a layer 2 of the coating and/or proofing substance. In Figure 2 I have shown at 10 a face view of a coated side of a single creped product. In proceeding in accordance with my invention, a web may be withdrawn from a roll and coated, by any suitable mechanism with a layer of the desired coating substance. It may then be passed through a drying or setting zone wherein it may be festooned, if desired. Afterward it may be creped in any suitable way, as upon a creping cylinder, from which it is removed by a creping doctor. My invention is not limited to the instrumentalities suggested. Any method or mechanism may be adopted for imposing a layer of coating substance on the sheet, and any method of setting the coating may be employed, including, but without limitation, the use of heat, dry air, exposure to chemical fumes, and various chemical treatments. Likewise the creping procedure may be any desired. I may employ a water creping process. Where the web is to be joined upon one side to a backing substance, such as cloth or other materials, I may employ the creping process of my Reissue Patent No. 17,633. Where universal stretchability is desired, I may employ the process of the co-pending application of William C. Kemp, Serial No. 626,059, filed July 29, 1932, which has matured into Patent No. 2,008,181 July 16, 1935, and I have shown at 8 in Figure 3, a face view of a double creped product, creped in accordance with the said process and embodying the present invention. Likewise my invention is applicable

to creped and corrugated webs and I have illustrated at 9 such a web in Figure 4. The corrugating may be done, if desired, in accordance with the teachings of the co-pending application of Rowe and Morris, Ser. No. 622,698, filed July 15, 1932, which has matured into Patent No. 2,034,421 July 15, 1932.

Where the paper is creped by means of the positive adhesive action of a substance such as asphalt for example, the paper may be coated upon both sides if desired; and a coating upon that side to which the thermoplastic adhesive is applied, particularly as in composite materials of textile and paper, may serve to seal the paper against penetration or staining by the thermoplastic adhesive, thus permitting the use of a softener or staining adhesive, which may be desirable in some uses. Again, in plural-layer, composite fabric, or lined bags, it is sometimes desirable to have the coating upon the outside of the liner or inner paper layer to keep moisture, reaching the liner from the outside, from weakening it.

It is likewise desirable, in certain circumstances, to have a coating on the inside of the liner. When damp materials are packed in a bag or other container, an inner coating helps to retain the moisture as well as to protect the paper from the contents of the container. An interior coating is also useful where chemical or acid resistance is desired. The paper may, of course, be coated on both sides where required.

I have discovered that the appearance, for example of a lacquer coated sheet made by applying a coating of the lacquer prior to the creping operation differs radically and importantly from the appearance of a sheet to which lacquer has been applied after the creping operation. It is somewhat difficult to describe this difference in appearance, but I would say in general that a sheet which has been coated prior to creping is characterized by a finer and more velvety appearance, and particularly by a more definite demarkation of the rugosities therein, and a superior sheen. Its physical qualities are also improved as has been set forth above. When employing the process of my reissue patent and/or the process of the Kemp patent, the fine and velvety character of the creping and/or the peculiar texture imparted to the sheet by double creping, results in the production of a coated sheet of highly ornamental and beautiful character, having much the appearance of fine grades of polished leather. It will be clear that my coatings may have any color desired, or may be black or white, and also that my coatings may be applied to the paper in ornamental designs where desired. Highly decorative fabrics may be made in this way having application not only to the usual articles in which creped paper is employed, but also to the formation of wall and floor coverings and other decorative manufactures. It will also be clear that my creped webs may be joined to backing substances of flexible or inflexible character, and especially where my webs are characterized by universal stretchability, they may be joined to other articles having irregular surfaces, and caused to conform with ease to such surfaces. My webs may likewise be treated to form other configurations therein, such for example, as corrugations and the like, with or without creping, and may likewise be embossed or formed into different regular or irregular shapes. The coatings on my webs have very little tendency to craze or crack, particularly since conjoint stretching of the web and the film occurs.

I have shown in Figures 3 and 4 a bag having side walls 3 and 4 and a bottom closure 5. I have also shown a center seam 6. The nature of these bottom and side closure seams is not a limitation on my invention, and I have not indicated them otherwise than diagrammatically. The bag consists of a layer of cloth 7, such as burlap, Osnaburg, cotton scrim, or the like. I have indicated at 1 a layer of creped paper and at 2 the coating thereon. The layer of creped paper may form a loose liner in the bag, or it may be cemented or otherwise secured to the fabric layer. It will be clear that a bag of this character not only has superior proofness over articles of similar character not embodying my invention, but that where the lacquer or other coating is disposed on the inside of the bag, many advantages may be obtained, such as a superior appearance, any color desired, including particularly white where the bag or container is intended for food stuffs, a superior appearance of sanitation and superior actual sanitation by reason of the proofed character of the fabric and the non-absorbent and impervious character of the film thereon.

I have hereinabove spoken of coating substances. It should be understood that I do not exclude substances which tend in greater or less measure to be absorbed into or to penetrate the sheet or web. For the most part my beneficial results are attained in greatest measure where, in spite of any saturation or penetration which may occur, there remains on the surface of the web a superficial coating of the desired substance.

Various modifications may be made in my invention without departing from the spirit thereof.

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

1. A web creped in at least one direction and coated within and without the rugosities with a substantially uniform layer of a coating substance comprising one or more members of the following group:—cellulosic compounds, lacquers, varnishes, oxidizing oils and condensation resins.

2. An article as claimed in claim 1, in which the coating substance contains sufficient plasticizing agent to permit the rugosities in the film of coating to unfold conjointly with the rugosities in the paper as the coated deformed web is stretched, without disruption of the film of coating.

3. A process of producing coated webs which comprises coating a web with a layer of coating substance, setting up said layer of coating substance to a non-tacky condition, and afterward forming rugosities conjointly in said web and said coating substance.

4. A process of producing coated webs which

comprises coating a web with a film of a coating substance containing a plasticizer, setting up said web to a non-tacky condition and forming rugosities conjointly in said web and said coating substance without disrupting said film of coating substance.

5. A process of producing coated creped webs which comprises coating a web with a coating substance, setting up said coating substance to a non-tacky condition and afterward creping said web and said coating substance.

6. A process of producing coated and creped webs which comprises coating a web with a coating substance comprising one or more members of the following group:—cellulosic compounds, lacquers, varnishes, oxidizing oils and condensation resins,—setting up said coating to a non-tacky condition and creping said web.

7. A lacquered creped paper characterized by a fine and velvety appearance and a high degree of sheen imparted thereto by first coating said paper, setting up said coating to a non-adhesive condition and afterward creping the coating and the paper conjointly.

8. A web creped in one direction at least and bearing on its surface a substantially continuous coating of tenacious, flexible, but substantially non-plastic and non-tacky character under normal conditions of use, said web and said coating having conjoint rugosities formed therein, and said coating being of substantially constant thickness.

9. A web, bearing on its surface a continuous coating of a coating substance which is tenacious, flexible, but non-plastic and non-tacky under normal conditions of use, said web and said coating being conjointly creped, and said coating being of substantially constant thickness on the peaks and in the valleys of the creping crinkles in said web.

10. A container, a wall of which comprises a web, creped in one direction at least and bearing on its surface a substantially continuous coating of a tenacious, flexible, but substantially non-plastic and non-tacky character under normal conditions of use, said web and said coating having conjoint rugosities formed therein, and said coating being of substantially constant thickness.

11. A container, a wall of which comprises a lacquered creped paper characterized by a fine and velvety appearance and a high degree of sheen imparted thereto by first coating said paper, setting up said coating to a non-adhesive condition and afterward creping the coating and the paper conjointly.

WILLIAM WALLACE ROWE.