

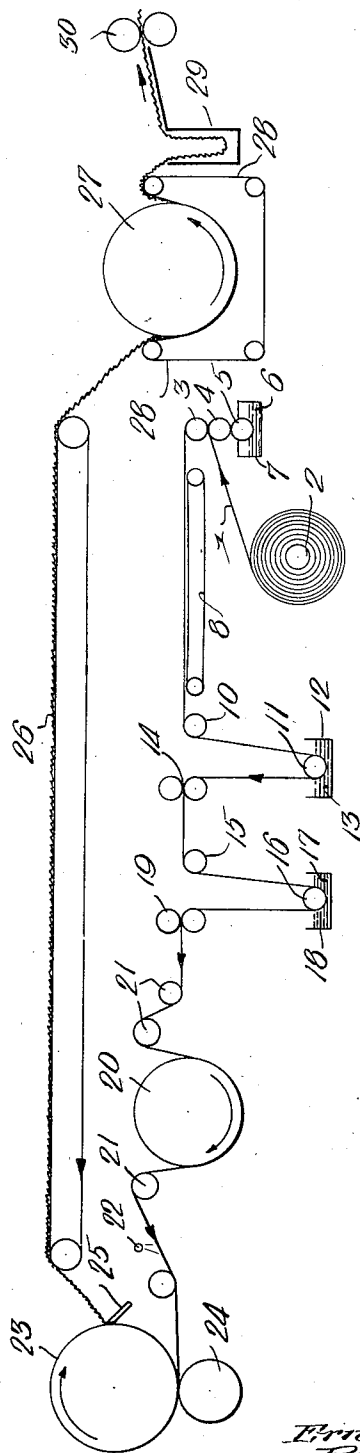
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PARCHMENTIZED CREPE PAPER AND METHOD OF MAKING

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UNITED STATES PATENT OFFICE

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PARCHMENTIZED CREPE PAPER AND METHOD OF MAKING

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This invention relates to crepe paper and provides a method of preparing the same and at the same time imparting special properties to the creped sheet.

5 Crepe paper, as heretofore made, has consisted of a sheet of tissue or other soft textured paper to which an adhesive creping solution has been applied, followed by passing it over a creping roll and creping it therefrom by the scraping action of a doctor blade. Such papers are widely used for decorative purposes in which their softness of texture is highly desirable, permitting them to be shaped readily in whatever way may be desired.

For special purposes, however, it is desirable to have a smooth finish upon one side of the creped paper, to resist wetting or to prevent adhesion of other surfaces thereto. This is particularly the case with crepe papers to which an adhesive has been applied and which is to be rolled or folded together for storage prior to actual use,—as with the tacky adhesive crepe paper or painters' tape disclosed in our copending application Serial No. 469,976, filed July 23, 1930, for example. This paper is provided with a non-hardening adhesive, which remains tacky but cohesive and may be readily attached to surfaces to protect the same and at the same time may be readily and completely stripped therefrom when desired. Nevertheless, when such paper is to be folded or rolled up for an appreciable length of time before use it is desirable to render the uncoated side more positively resistant to permanent adhesion to the coated surface.

An object of the present invention, therefore, is to provide a crepe paper which shall be relatively flexible and elastic and which shall be substantially resistant to wetting by water or the softening action of other liquids such as oil, grease, etc. It is also an object to provide a smooth surface thereon which shall prevent appreciable adhesion upon contact with tacky substances. It may be a further object to leave an untreated surface which shall retain the usual soft-textured appearance and feel, or rough readily wetted fibrous structure and other characteristics of the un-

treated paper, as for painters' tape and the like. Other objects will appear from the following description.

The method of the invention includes in general the application of a parchmentizing solution such as sulfuric acid, zinc chloride, or the like, of a suitable concentration to one surface of the sheet of paper to be used, permitting the solution to react upon and soften the paper sheet for a definite period of time, neutralizing the same, washing to remove the residues of such reagent materials, and then, either with or without the supplemental addition of a creping solution to the sheet, passing the same to a creping drum (preferably with the treated surface in contact with the creping roll if no creping solution is to be employed) and finally creping the sheet from the roll by contact with a suitably adjusted doctor blade. The creped sheet is then dried and may be rolled up for use, per se, or subjected to further treatment,—such as the application of an adhesive coating thereto, as more fully described in the copending application for patent referred to above.

The resulting sheet is characterized by having a firm, resilient elastic structure, relatively resistant to water—and also to the penetration and reaction of chemical reagents generally, on one side—and a soft textured, rough or fibrous readily wetted and penetrable surface, integral therewith, on the other side. Moreover, owing to the strengthening effect of the parchmentizing treatment, a softer or looser textured paper than is ordinarily suitable for subjecting to the creping operation may be employed and will produce a finished sheet of adequate strength. Again, the soft side of the sheet may be treated, as by dyeing, etc., or coated with an adhesive composition (as in the copending application already mentioned), and the finished sheet may be rolled or piled without serious adhesion. On the contrary, the sheets may be rolled up, stored and later unrolled and leave none of the adhesive upon the finished or uncoated surface.

An example of the invention will be described with respect to its application to a light weight kraft paper sheet, to produce a

creped sheet suitable for use in the preparation of a painter's tape. Suitable apparatus is shown in the accompanying drawing, in which the figure is a diagrammatic side elevation.

5 In operation of the process with the equipment illustrated, a sheet of light weight, soft textured kraft paper 1, is drawn from the roll 2 and passed between the uppermost pair of the chemically resistant rollers 3, 4, 5, of
10 which the lowest may dip into a suitable parchmentizing solution 6 contained in the tank 7. This solution may, for example, consist of sulfuric acid solution of approximately
15 66° Bé. gr. at 75° F., though other rapidly parchmentizing solutions, which are well known, may be substituted therefor.

As the sheet passes between the rolls it receives a uniform layer of the sulfuric acid which thoroughly wets the entire surface. It
20 may not penetrate deeply or pass through the sheet, however, inasmuch as the action of the sulfuric acid upon the fibers and intervening cellulosic matrix of the sheet is to cause the
25 same rapidly to swell and thus to resist further penetration. Hence the depth of the parchmentizing effect may be controlled and limited substantially to the entrant or treated
30 side of the paper sheet—or it may be such as to penetrate deeply,—or even completely through the sheet (by wetting both sides) in order to obtain special effects, such as an increased or maximum stiffness or water resistance in the finished creped sheet.

35 The treated sheet 1, with the parchmentizing solution now on its upper surface passes to the belt conveyor 8 which is of such length and operated at such speed as to allow sufficient time for the desired reaction of the solution upon the paper sheet. In the instant
40 case, for example, approximately 15 seconds may be recommended. The sheet then passes over and under guide rollers 10 and 11, respectively, through a neutralizing solution
45 12 of caustic soda or the like in tank 13, and thence through squeeze rolls 14 and thence over and under similar guides 15, 16 through a water bath 17 in tank 18. The wet sheet
50 may now be passed between squeeze rolls 19 to remove excess water and over a preliminary drying drum 20, guided by rolls 21, and thence through a creping bath or be sprayed or otherwise covered with adhesive as by an
55 overhead spray 22. But, owing to the parchmented or gelatinized surface of the paper sheet, it is relatively plastic and adhesive, per se, which facilitates adhesion to the creping drum 23, against which it is firmly pressed by the roller 24. The drum may be
60 heated according to customary practice, or this may be dispensed with, as required by the other conditions of the process. The sheet is next crinkled or creped and removed from the creping roll by contact with the
65 doctor blade 25 and the creped sheet removed,

preferably upon a belt conveyor 26 which permits it to dry further. At this point the paper may be embossed or crinkled (e. g. transversely of the creping) if desired and then conducted about a drying drum 27 and held in contact therewith as by means of a flexible belt 28, from which it is delivered to a take-up bin 29 and finally gathered upon the roller 30 or passed to further treatments as may be desired.

The firm adhesion of the parchmented surface of the paper sheet to the creping drum, while in its initially softened condition, makes possible the production of a fine crepe structure as it is removed by the doctor blade. This is an accomplishment not heretofore known or realized in the prior art and is especially effective with heavier weights of paper. It is also to be observed that it facilitates the production of a crepe paper of high "crepe ratio"—that is, in which the ratio of the length of a sheet of crepe paper which has been stretched to the length of the sheet before stretching is relatively large. For example, a crepe ratio may be obtained of 1.3 to 2.5 or even higher.

We claim:

1. Method of making crepe paper, comprising the steps of applying a parchmentizing solution to a sheet of paper and subsequently creping the sheet.

2. Method of making crepe paper, comprising the steps of applying a parchmentizing solution to a sheet of paper, removing residual traces of the parchmentizing solution, and creping the sheet.

3. Method of making crepe paper, comprising the steps of applying a parchmentizing solution to a sheet of paper, neutralizing and removing residual traces of the parchmentizing solution, and creping the sheet.

4. Method of making crepe paper, comprising the steps of applying to one side of a sheet of paper a layer of parchmentizing solution, and subsequently creping the sheet from the thus treated surface.

5. Method of making crepe paper, comprising the steps of applying to one side of a sheet of paper a layer of parchmentizing solution, removing residual traces of the parchmentizing solution, and subsequently creping the sheet from the thus treated surface.

6. Method of making crepe paper, comprising the steps of applying to one side of a sheet of paper a layer of parchmentizing solution, neutralizing and removing residual traces of the parchmentizing solution and subsequently creping the sheet from the thus treated surface.

7. Method of making crepe paper comprising the steps of applying a parchmentizing solution to a sheet of paper and creping the sheet while in softened condition.

8. Method of making crepe paper comprising

ing the steps of applying a parchmentizing solution to a sheet of paper, removing the parchmentizing solution and creping the sheet while in softened condition.

5 9. Method of making crepe paper comprising the steps of applying to one side of a sheet of paper a layer of parchmentizing solution, regulating the reactive effect of the same, and subsequently creping the sheet.

10 10. Method of making crepe paper, comprising the steps of applying a parch-
mentizing solution to a sheet of paper, regu-
lating the reactive effect of the same to
soften one side of the sheet, applying the
15 thus softened surface to a solid surface, and
creping the sheet therefrom.

11. Method of making crepe paper, com-
prising the steps of applying a parchmentiz-
ing solution to a sheet of paper, regulating
20 the reactive effect of the same to soften one
side of the sheet, applying the thus softened
surface to a solid surface, and creping and
embossing the sheet.

12. A sheet of crepe paper, characterized
25 by having a parchmented surface.

13. A sheet of crepe paper, characterized
by having a parchmented surface and an
unparchmented surface.

14. A sheet of crepe paper, characterized
30 by having a parchmented surface and em-
bossing thereon.

15. A sheet of crepe paper characterized
by having a smooth, parchmented sur-
face, and unparchmented surface and em-
bossing thereon.

16. A sheet of crepe paper characterized by
having a smooth, parchmented surface and
a fine crepe structure.

Signed by us at Framingham, Massa-
35 chusetts this fifteenth day of July 1930.

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