Aug. 8, 1939. B. ASNES 2,168,895

CREPED PAPER AND METHOD OF MAKING SAME

Filed July 8, 1936

Fig. 1

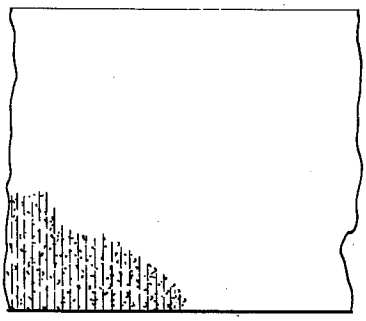


Fig. 2

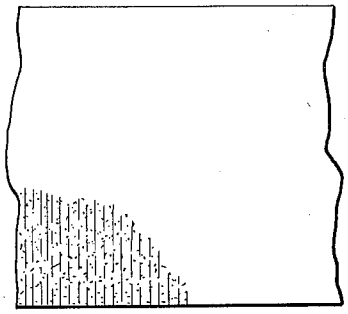


Fig. 3

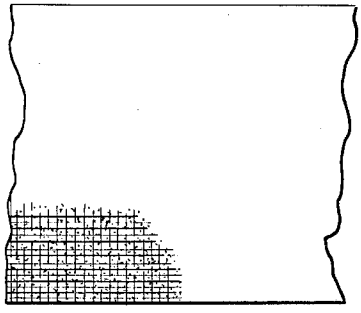
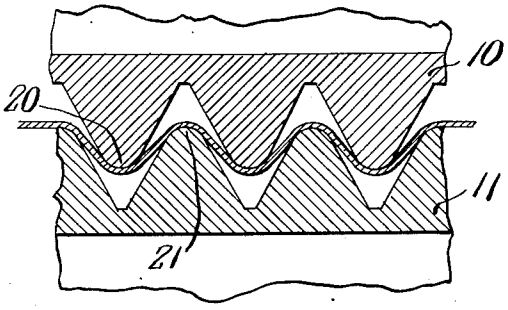


Fig. 5



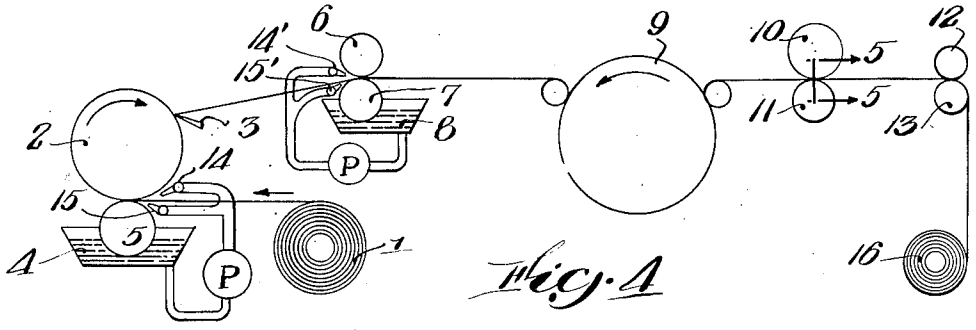


Fig. 4

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CREPED PAPER AND METHOD OF MAKING SAME

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10 Claims. (Cl. 154—33)

This invention relates to crepe paper of the type used for decorative purposes and has for its object to provide paper material which is not only soft and yielding but which has a sheen or a glistening appearance.

According to this invention the paper has glistening flakes applied to its surface and is creped to cause the flakes to occupy different angular positions relatively to the plane of the paper. The longest dimensions of the flakes are preferably less than the distances between the crests of successive ridges of the creped paper so that the flakes do not bridge the valleys between ridges, thereby accentuating the difference in angularity of the respective flakes. Owing to the irregular angularity of the flakes the resulting product has a distinctive appearance closely resembling silk. Best results have been obtained with mica flakes ranging in size from approximately fifty mesh to approximately three hundred mesh, but other flakes and sizes may be used depending upon the effect desired. A somewhat brighter appearance may be produced by lightly calendering the paper after creping to flatten the aforesaid ridges more or less. By corrugating the paper transversely of the ridges an appearance somewhat like moire silk may be obtained.

In another aspect the invention involves the application of the flakes to the paper without any adhesive coating, thereby maintaining the softness of the paper and enhancing its appearance. This is accomplished by mixing the flakes with the creping solution, whereby the flakes are slightly embedded in the paper in the creping operation, the anchorage of the flakes being assisted somewhat by the small percentage of glue customarily employed in creping solutions. In order to hold the flakes firmly without employing a substantial amount of adhesive I recommend a paper of open formation such as tissue paper formed partly or wholly of alpha cellulose stock.

Before admixture to the creping solution the flakes may be colored, by dyeing or otherwise, any desired color or colors, either the same color as that of the paper and/or creping solution or a different color.

For the purpose of illustration the typical embodiments of the invention are shown in the accompanying drawing in which:

Fig. 1 is a face view of a piece of crepe paper made according to this invention;

Fig. 2 is a similar view of of such paper after it has been lightly calendered;

Fig. 3 is a similar view of the paper after it has been corrugated;

Fig. 4 is a diagram illustrating the method of manufacture; and

Fig. 5 is the section on line 5—5 of Fig. 4.

The particular embodiment of the invention shown in Fig. 1 comprises a piece of tissue paper which is finely creped and which has small glistening flakes applied to the surface thereof in the manner described above. The modification shown in Fig. 2 is like that shown in Fig. 1 except in that, after the crepe paper has been partly or wholly dried, it is rolled between heated pressure rolls to flatten the crests of the crepe ridges, without completely ironing out the ridges. In the embodiment shown in Fig. 3 the paper, after being creped and coated as aforesaid, is run between corrugating rollers to produce corrugations extending transversely of the crepe ridges, the creping extending horizontally and the corrugations extending vertically in Fig. 3.

According to the present invention the preferred method of manufacture involves apparatus such as illustrated in Fig. 4, in which 1 is the supply roll of uncreped paper, 2 is the creping drum upon which the paper is creped by a doctor blade 3, 4 is a pan of creping solution which is applied to the paper on drum 2 by means of a roller 5 dipping into the solution, 6 and 7 are another pair of rolls for applying another coating to the paper if desired, the roller 7 dipping into a solution in another pan 8, 9 is a drying drum, 10 and 11 are corrugated rolls, 12 and 13 are calendering rolls and 16 is a take-up roll of the finished paper. Instead of printing the paper all over, the rolls 6—7 may print any desired pattern, in which case the coloring-matter would of course be applied to the rolls by so-called inking rollers. As shown in Fig. 5 the rolls 10 and 11 have complemental peripheral ridges 20 and 21 which produce in the paper corrugations as illustrated in Fig. 3, the rolls having sufficient clearance therebetween not to pinch the paper very tightly. The corrugating rolls are preferably (though not necessarily) located in advance of the calendering rolls, chiefly for the reason that the corrugating tends to reduce the sheen and subsequent calendering restores and even increases the sheen. Either the pair of rolls 10—11 or the pair 12—13 may be omitted if effect thereby produced is not desired.

The flakes of glistening material may be applied to the paper either by the device 4—5 or the device 7—8 or partly by one and partly by the other. For example, the flakes may be ap-

plied to one side of the paper by the roll 6 and to the other side of the paper by the roll 7. However each device preferably has associated with it means for applying the coating material to both sides of the paper. In Fig. 4 this means comprises a pump P for circulating the solution from the pan 4, a pair of nozzles 14 and 15 (or 14' and 15') which have rows of small apertures or slits for directing the solution to opposite sides of the paper at a location above the pan so that excess solution may flow back into the pan and be recirculated. Whether the flakes are applied to the paper by the roll 7 or by the roll 6 or by both rolls, the solution preferably comprises the ordinary creping solution to which has been added a quantity of flakes sufficient in amount to produce the desired degree of glistening effect.

After the crepe paper has been corrugated and/or calendered the creping wrinkles may be reduced in height by stretching the paper, as for example, by driving the take-up roll 16 somewhat faster than the calender rolls 12—13. Even though the creping wrinkles be largely removed the product resulting from the aforesaid treatment (creping and corrugating and/or calendering) has an appearance resembling silk or the like far more closely than that of any other paper product.

When the flakes are applied before creping (as by means such as shown at 4—5—14—15) the sheen is uniform throughout the entire surface of the paper, and when the flakes are applied after creping (as by means such as shown at 6—7—8—14'—15') the appearance is more or less mottled, particularly after the paper has been stretched to widen the valleys and reduce the height of the ridges.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A sheet of paper creped to produce alternate ridges and valleys with mica flakes adhering to the exterior surfaces of the ridges in different angular positions relatively to the plane of the paper, the paper being corrugated transversely of said ridges.

2. The method of making crepe paper which comprises creping the paper with a creping solution containing glistening flakes, thereby to anchor the flakes to the surface of the paper in the creping operation.

3. The method of making crepe paper which comprises creping paper of open formation with a creping solution containing glistening flakes, thereby to anchor the flakes to the surface of the paper in the creping operation.

4. The method of making crepe paper which comprises creping alpha cellulose paper with a creping solution containing glistening flakes, thereby to anchor the flakes to the surface of the paper in the creping operation.

5. The method of making crepe paper which comprises wetting the paper with creping solution, creping and drying the paper and, before drying, with the creping solution, cementing to the surface of the paper thin pieces of glistening material.

6. The method of making crepe paper which comprises wetting the paper with creping solution, creping and drying the paper, cementing to the surface of the paper, with the creping solution before drying, thin pieces of glistening material, and subsequently corrugating the paper transversely of the creping ridges.

7. A sheet of creped paper having alternate ridges and valleys in close succession, said ridges being compressed transversely of the plane of the paper, and mica flakes disposed substantially wholly on the surface of the paper in different angular positions relatively to the plane of the paper.

8. A sheet of creped paper having alternate ridges and valleys in close succession with mica flakes disposed substantially wholly on the surface of the paper, the largest dimensions of the flakes being less than the distances between the crests of said ridges, whereby the flakes occupy different angular positions relatively to the plane of the paper.

9. The method of making crepe paper which comprises creping the paper to produce alternate ridges and valleys, cementing glistening flakes to the exterior surface of the paper, and stretching the paper to widen said valleys, thereby to vary the angular positions of the flakes relatively to the plane of the paper.

10. The method of making crepe paper which comprises creping the paper to produce alternate ridges and valleys, cementing glistening flakes to the exterior surface of the paper, calendering the paper to compress said ridges, and stretching the paper to widen said valleys, thereby to vary the angular positions of the flakes relatively to the plane of the paper.

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