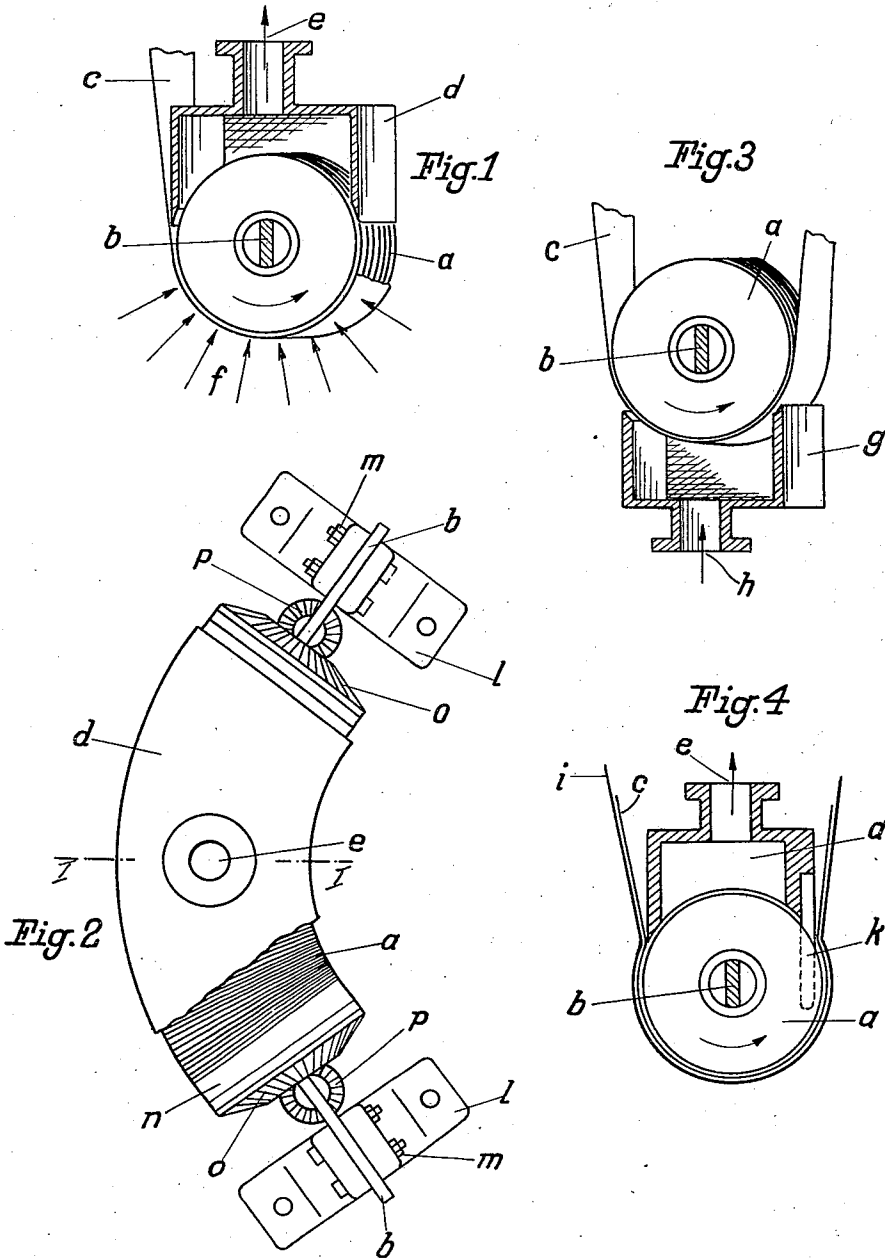


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PROCESS AND APPARATUS FOR THE LONGITUDINAL GREPING  
OF WEBBS OF PAPER OR OTHER SHEET MATERIAL  
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## UNITED STATES PATENT OFFICE

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## PROCESS AND APPARATUS FOR THE LONGITUDINAL CREPING OF WEBS OF PAPER OR OTHER SHEET MATERIAL

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In my co-pending application Serial No. 77,430 filed on May 1st, 1936, a process is described for the longitudinal creping of webs of sheet material, more particularly paper, which comprises passing the web over a body having a curved surface which corresponds to part at least of the curved surface of a roller having a stationary curved axis as a reference line and in a direction from the convex toward the concave part of said surface, and pressing the web against said surface while passing it over the same.

In order to produce the necessary pressure on the surface of the sheet material, various means are employed, for example shaped members which embrace the curved surface of the body, bands of flexible material, cords or the like.

It has now been found that the desired application of the sheet material to the curved surface of the body is possible or may be reinforced in a particularly simple and advantageous manner by utilizing air pressure action (vacuum or pressure), the formation of the crepe creases being at the same time initiated and continuously assisted.

It is in this case essential that the apparatus should be so constructed as to render possible the production of vacuum or pressure on the web to be treated.

It has it is true been proposed, in the transverse creping of paper by means of smooth or toothed scrapers, to apply the paper, by means of air pressure action, to a cylinder which feeds the paper to the scraper. In this case, the application of the paper to the cylinder is effected by air pressure action solely for the purpose of offering to the scraper the resistance necessary for the formation of crepe creases by pressing the paper firmly on the cylinder. The same applies also to a similar known apparatus in which the paper to be creped transversely by means of a scraper is first corrugated longitudinally by profiled rollers co-operating with corresponding grooves of the cylinder, whereupon the longitudinally corrugated paper is then held firmly by air pressure action for the purpose of subsequent creping.

It is furthermore known to provide paper with transversely or longitudinally extending corrugations solely by air pressure action, the paper being pressed or sucked by air pressure action into the profiling of a body which is rigid per se. In this known process also, the air pressure action has not the object of initiating and continuously assisting the formation of crepe creases in combination with a deformable body.

The invention is represented by way of example in the accompanying drawing, wherein:

Figure 1 shows the device in section on line I—I of Figure 2.

Figure 2 shows the device in plan.

Figure 3 shows a modified construction in section corresponding to Figure 1.

Figure 4 shows a further modified construction in section corresponding to Figure 1.

In the construction according to Figures 1 and 2, *b* is a curved spindle clamped by the screws *m*, *m* in the two bearing brackets *l* arranged obliquely relatively to one another. The roller *a* consisting of metal discs is rotatably mounted on the stationary curved spindle *b* and is provided at both ends with a closure flange *n* with a bevel gear *o* which is fixed thereon and in its turn is driven by a pinion *p* off a common driving source.

Arranged above the roller *a* is a vacuum hood *d*, which has been partly omitted in Figure 2 in order to show the underlying roller *a*.

The web of sheet material to be creped enters the apparatus on the left. It is sucked against the roller *a* by vacuum. For this purpose, the hood *d* is located above the roller and may be connected at *e* to a vacuum pump or suction fan. The vacuum prevailing in the hood *d* spreads through the interstices of the metal discs *a* to the lower side of the roller, so that the web is applied firmly to the creping roller by the external air pressure.

In the construction according to Figure 3, the web is applied to the roller by pressure from a chest *g* into which air is pumped at *h*.

The degree of pressure difference necessary depends upon the thickness, softness and humidity of the web to be treated. If for the purpose of a more convenient guiding of the web special guiding members, for example bands or cords are employed, the pressure difference may provide a more or less considerable part of the pressure of application, so that the bends or the like are correspondingly relieved of load, or require to be tensioned less.

If, in the case of the use of curved rollers consisting of discs, intense creping is carried out, it is expedient to facilitate lifting off the creped web by special means. This may be effected for example by means of tongues which, at the place of exit of the creped web, project into the gaps between the discs, as indicated in Figure 4 at *k*. The provision of such tongues is also possible in the case of Figure 3, but with the difference that the tongues must be fixed not to the chest *g* but independently thereof. In the case of Figure

4, on the contrary, the tongues may be attached to the hood *d*, which provides a particularly simple constructional solution of the problem.

Of course other means, particularly those employed in the filter art, may be employed for lifting the creped web off the creping roller, for example, the injection of compressed air at the place where the web is to be detached from the surface of the creping roller.

In Figure 4, at *i* is indicated a guiding band which covers the web to be creped in the region of the roller *a* and produces some of the necessary pressure of application. In the case of papers or the like which are pervious to air, the band may provide a seal from the outer atmosphere. This last-mentioned effect is also valuable if the web to be creped is narrower than the creping roller, so that margins uncovered on either side cannot impair the action of the vacuum by excessive entrance of air.

I claim:

1. A process for the longitudinal creping of a web of sheet material, particularly paper, which comprises passing the web over a body having a curved surface which corresponds to part at least of the curved surface of a roller having a stationary curved axis as a reference line and in a direction from the convex toward the concave part of said surface, and pressing the web against said surface by air-pressure action while passing it over the same.

2. A device for the longitudinal creping of webs of sheet material, particularly paper, comprising, in combination, a body having a curved surface which corresponds to part at least of the surface of a roller with a stationary curved axis as a reference line, means for passing the web over

said surface in a direction from the convex toward the concave part thereof, and means for exerting air pressure on the part of the web in contact with said surface so as to press the same against said surface, said body having interstices for the passage of air from its surface towards its interior.

3. A device as claimed in claim 2, in which said interstices are of dimensions allowing the formation of the crepe creases therein.

4. A device for the longitudinal creping of webs of sheet material, particularly paper, comprising, in combination, a curved roller in the form of a plurality of discs mounted for rotation on a common curved stationary axis as a reference line, means for causing the web to travel in a direction from the convex toward the concave part of the roller, means for exerting air pressure on the part of the web in contact with the roller, and tongues projecting into gaps between the discs where the web leaves the surface of the roller, said tongues serving to facilitate the disengagement of the creped web from the roller.

5. A device for the longitudinal creping of webs of sheet material, particularly paper, comprising, in combination, a curved roller mounted for rotation about a curved stationary axis as a reference line, said roller having circumferentially extending gaps in its surface, means for causing the web to travel in a direction from the convex towards the concave part of the roller, means for exerting air pressure on the part of the web in contact with the roller, and tongues projecting into the gaps in the surface of the roller and serving to facilitate the disengagement of the creped web from the roller.

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