Nov. 4, 1930. J. E. KIEFFER 1,780,526

SHOCK ABSORBING CUSHIONING PAPER AND METHOD OF MAKING SAME

Filed Dec. 27, 1927

FIG. 3

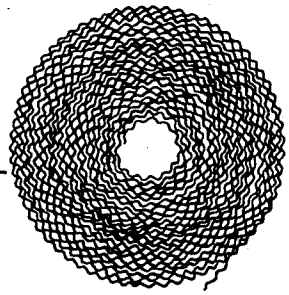


FIG. 4

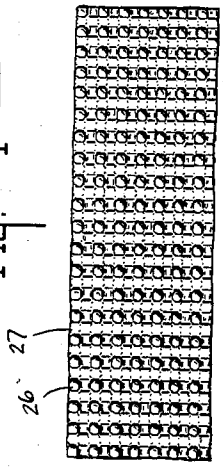


FIG. 5

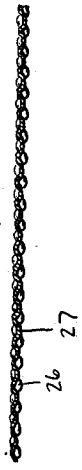


FIG. 1

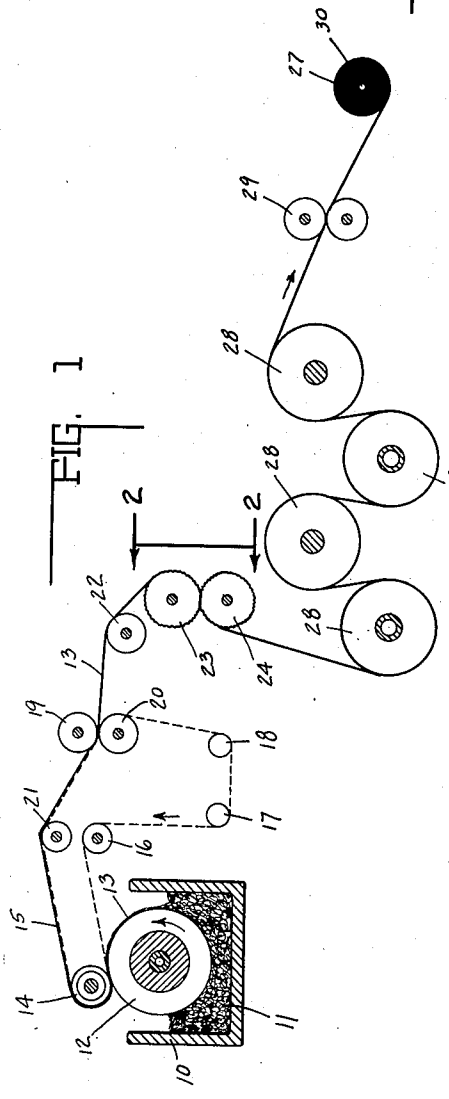
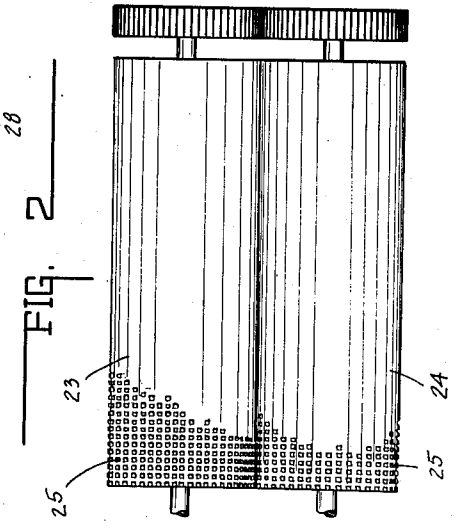


FIG. 2



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UNITED STATES PATENT OFFICE

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SHOCK-ABSORBING CUSHIONING PAPER AND METHOD OF MAKING SAME

Application filed December 27, 1927. Serial No. 242,875.

This invention relates to a light weight shock absorbing indented paper to be used particularly for protecting glassware and the like, the indentations being substantially square or round as distinguished from corrugated paper. Thus, paper of this character may be rolled in any direction for convenient handling at the mill, as well as causing it to more readily conform to the shape of the article protected.

The principal object of the invention is to provide paper of this particular character made by forming or pressing the indentations in the paper making web while in its wet and plastic condition and before passing the same about the drying rolls, as distinguished from forming such indentations after the paper has been manufactured and dried. Thus, the finished product embodies the desired surface formation in its natural state. In other words, the indentations are formed in the paper while being manufactured and before the final completion thereof. This causes the fibers of the paper to naturally assume the shapes and positions to form the indented surface as distinguished from their being deformed from their natural formation and condition where the paper is first made in the flat and thereafter indented.

This permits of indenting a lighter stock of paper forming more resilient and deeper indentations therein, and giving the paper more resiliency by reason of the tendency of the fibers to return to their normal indented position. Thus, a great saving is effected both in stock and shipping, through the decrease in the weight of paper having better cushioning qualities.

The full nature of the invention will be understood from the accompanying drawings and the following description and claim.

Fig. 1 is a diagrammatic illustration of a paper making machine showing the paper passing through the indenting rolls prior to the drying rolls. Fig. 2 is an elevational view of the indenting rolls taken on the line 2—2 of Fig. 1. Fig. 3 indicates an end elevation of the roll of the indented paper. Fig. 4 is an enlarged section showing a plan view of the indented paper. Fig. 5 is a section taken on the line 5—5 of Fig. 4.

In the drawings there is illustrated diagrammatically a paper making machine having a vat 10 containing a quantity of pulp 11 in which there is rotated the cylinder mold 12 which draws the fibrous pulp about the periphery thereof in the form of a web 13 by the usual vacuum created in the interior thereof. Associated with the cylinder mold there is a couch roll 14 carrying the wet felt 15 which passes around the rollers 16, 17 and 18, and between the press rolls 19 and 20. The wet felt carries the web 13 over the couch roll and the supporting roll 21 between press rolls 19 and 20 and over the wooden carrying roll 22 to the indenting rolls. This arrangement and process is of the usual character employed for the manufacture of paper in the well known cylinder type of machine. As many vats and cylinder molds may be used as may be desired for increasing the number of thicknesses or layers of web from which the paper is formed.

Mounted in position to receive the web 13 from the carrying roll there are a pair of indenting rolls 23 and 24 placed one above the other, which rolls are provided with a plurality of equally spaced projections 25 adapted to press the indentations 26 into the paper 27. The wet pulp-like web 13 is carried between said rolls so that the fibers are formed to provide the indentations and corresponding projections and are compressed in such position while still in a plastic condition. Thereupon the web passes from between the indenting rolls to the usual smooth surfaced drying rolls 28 through the draw rolls 29 to a winding spool 30 where it is temporarily wound as it comes off of the machine.

As is the practice, a number of winding spools may be employed so that as fast as the paper has been wound to the maximum diameter on one spool, it may be rewound upon the final commercial roll for transportation and convenient handling.

The invention claimed is:

As an article of manufacture, a shock absorbing cushioning paper provided on both of its sides with a multiplicity of molded hollow

resilient protuberances closely spaced in all directions, said protuberances having been molded into said paper after it has been completely formed and after a substantial portion of its water content had been removed without materially decreasing is plasticity or causing the fibers to set in their usual substantially flat condition, and prior to the final conditioning and setting of the fibers of the paper, said resilient protuberances serving to impart to said paper a rubber-like resiliency normal to the surface.

In witness whereof, I have hereunto affixed my signature.

JOHN E. KIEFFER.