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METHOD OF AND APPARATUS FOR SEVERING SHEETS FROM A WEB

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Fig. 1.

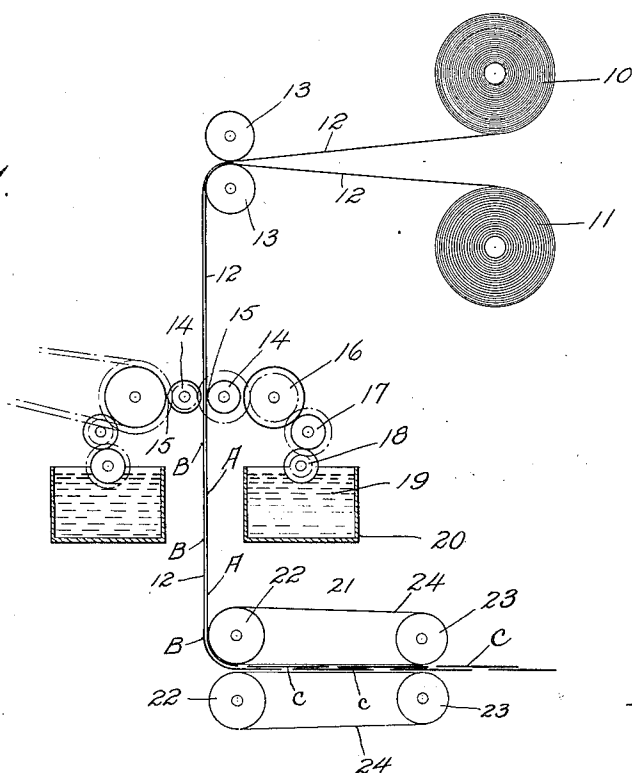
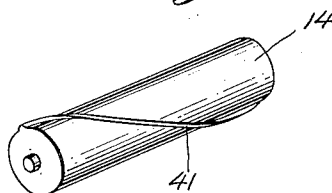


Fig. 2.



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METHOD OF AND APPARATUS FOR SEVERING SHEETS FROM A WEB.

Application filed January 3, 1922. Serial No. 526,814.

To all whom it may concern:

Be it known that I, COURTNEY P. WINTER, a citizen of the United States, and resident of New Brunswick, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in a Method of and Apparatus for Severing Sheets from a Web, of which the following is a specification.

My invention relates to the method of severing sheets from a web, and particularly to a method of this type in which the continuity of the web is least affected.

In packaging sheets of paper or the like it is desirable to have the sheets retain a related position and in this web-like condition to be fed to the folding machine which thereafter folds and compacts the same. It is the object of this invention therefore to sever a web or webs of material into sheets of the desired size, retaining these sheets in a certain relation one to the other, that is, with the sheets semisuperimposed one upon the other.

In carrying out my invention, I feed one or more webs of material between one or more rolls which I will hereinafter term scoring rolls, whereupon the web or webs are scored with moisture, describing upon the web or webs a predetermined weakened area. My invention further contemplates the separating of the web at these predetermined weakened areas into sheets without however, destroying the continuity of the web, or in other words, without entirely displacing the sheets from their superimposed position upon one another so that the sheets may thereafter be conveniently fed to the folding machine and be thereafter folded and compacted into packages.

My invention contemplates therefore broadly, the means for insuring a severance of the web into sheets and while I have herein shown two constructional examples of my invention, it will be obvious that various means may be employed for accomplishing this result.

The various features of my invention and the manner of carrying out the same will be made more apparent in the accompanying specification and drawings. In the drawings, in which two illustrative examples are shown,

Fig. 1 shows diagrammatically, an ar-

range ment wherein two webs of material are employed, and

Fig. 2 is a detailed perspective view of the scoring cylinder.

In the drawings wherein like numerals refer to like parts, the numerals 10 and 11 indicate rolls of papers or other material, the web 12 of which material is unwound by a pair of rollers 13.

The web now composed of two sheets passes between (see particularly Fig. 1) a pair of what will be termed scoring rolls 14. These rolls are each provided with a longitudinally extending rib 15, for a purpose to be more fully hereinafter described. Associated with each scoring roll 14 is a series of contacting rollers here indicated by the reference characters 16, 17 and 18 respectively. However the number and position of these associated rollers may obviously be varied as desired. The roller 18 is disposed so as to dip into water or other suitable liquid 19 contained in a tank 20. The liquid picked up by the roller 18 is consequently transferred upon the roller 17, then upon the roller 16, which roller in turn engages the projection or rib 15 formed on the scoring roll.

Obviously, the rib or projection of each scoring roll is kept moistened and as each rib engages the web of material 12 passing between the pair of said rolls, the web immediately adjacent is scored by a line of moisture transferred to the web by the said rib. These lines of scoring by moisture are indicated on one of the webs 12 by the reference character A and on the other web by the reference character B.

In the operation of my invention this scoring by moisture and the subsequent movement of the paper, happens in such close sequence that the double web of paper 12 arrives at the severing means indicated broadly by the reference character 21, before the line of moisture has penetrated through to the adjoining web. In this behalf, it should be noted that the ribs or projections 15 are disposed at diametrically opposite longitudinal points on the rolls 14 and hence score the web alternately at spaced opposite points.

The double web 12 is thereafter carried through the severing mechanism which as hereinbefore stated in Fig. 1, is indicated by

the numeral 21. Obviously the only action necessary to sever the sheets is to exert a tension or pulling movement upon the web 12. One manner of accomplishing this is illustrated in Fig. 1, wherein I have shown a pair of rollers 22 and a pair of rollers 23 spaced therefrom. Suitable supporting means such as a belt 24 or the like may be provided. The pair of rollers 23 are rotated at a higher rate of speed than the rollers 22 and consequently there is exerted upon the double web 12 a tension which separates the web into sheets along the predetermined lines of weakness formed by the moistened areas. These sheets are indicated by the reference character C. However, the speed of the two pair of rollers 22 and 23 is such that after severance of the web into sheets, the sheets are not entirely displaced from their superimposed position one with the other, but retain the position illustrated diagrammatically in Fig. 1. In this condition, the continuity of the web as a whole is maintained and the sheets are fed in this particular relation to a folding machine or the like, wherein they are folded and compacted in the manner known to those skilled in the art.

Obviously, the separating or severing mechanism 21 may be modified without impairing the efficiency of my invention as it is obvious that the rollers 23 may be operated by eccentric gearing or the like, whereby their peripheral speed will be varied and the desired tension applied periodically to the web, thereby effecting the severance of the web into sheets.

Obviously, the means on the rolls 14 for transferring the moisture to the web may be modified in various ways. For instance, I have found it efficient to provide taut cords upon the roll 14. Also lengths of flexible material such as wire, felt, raw-hide or the like. This material will be kept moistened by its periodical contact with the cooperating roller 16 and will in turn moisten the web at separated points.

In Fig. 2 I have shown the scoring roll 14 as provided with a spirally arranged rib 41, the use of which scores the web along a line disposed angularly to the length of the web. From this it will be obvious that the shape

of the scoring line may be varied by modifying the shape of the rib or moisture transferring member carried by the roll 14.

While I have illustrated a constructional example of my invention, it is obvious that my improved method may be employed in numerous other ways without departing from the spirit and scope thereof and to this end I reserve the right to make such modifications and changes in the form and arrangement of the mechanism employed and the sequence of performance, as may come within the purview of the accompanying claims.

Having thus described my invention what I claim is:

1. In an arrangement of the class described, means for alternately moistening a double web on opposite sides thereof and means for tensioning said web to separate the same into sheets, said separation occurring along said predetermined lines of weakness.

2. In an arrangement of the class described, means for alternately scoring a web of material on opposite sides by moistening, said means including scoring rolls provided with moistening projections, and means for tensioning said web to separate the same into sheets, said separation occurring along the predetermined lines of weakness formed by the moistened areas.

3. The method of severing sheets from a multiply web which consists in alternately moistening said web on opposite sides at spaced intervals and subjecting said web to a tension to separate each ply of said web into sheets, said sheets remaining in a relative superimposed position.

4. In an arrangement of the class described, means for alternately scoring by moistening a double-ply web on opposite sides thereof at spaced intervals, said means including a pair of cooperating scoring rolls, moistening ribs carried by said rolls, means for maintaining said ribs moistened and means for tensioning said web for separating each ply into sheets, said separation occurring along the predetermined lines of weakness formed by the moistened areas.

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