

Dec. 29, 1925.

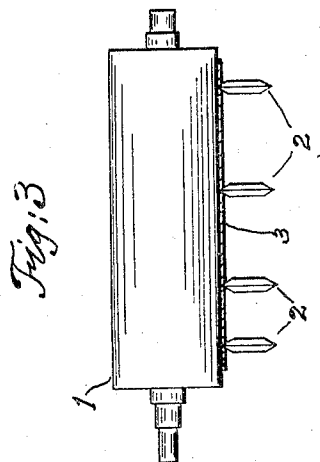
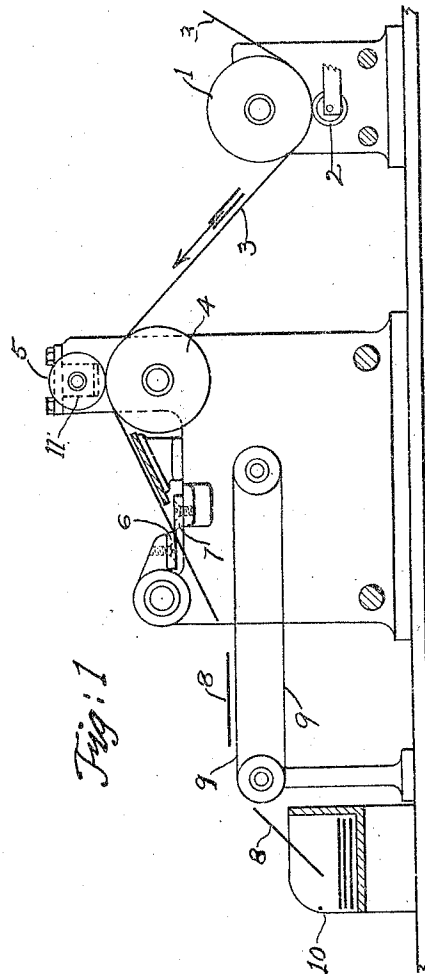
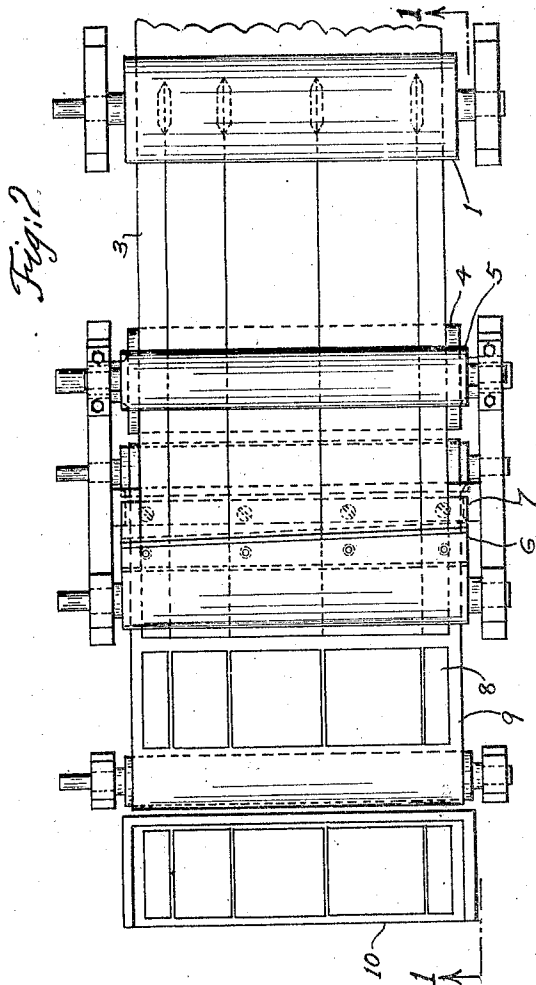
J. A. CAMERON ET AL

1,567,706

MECHANISM FOR CONVERTING A WEB OF FLEXIBLE MATERIAL INTO SHEETS

Filed Nov. 21, 1924

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

Fig: 4

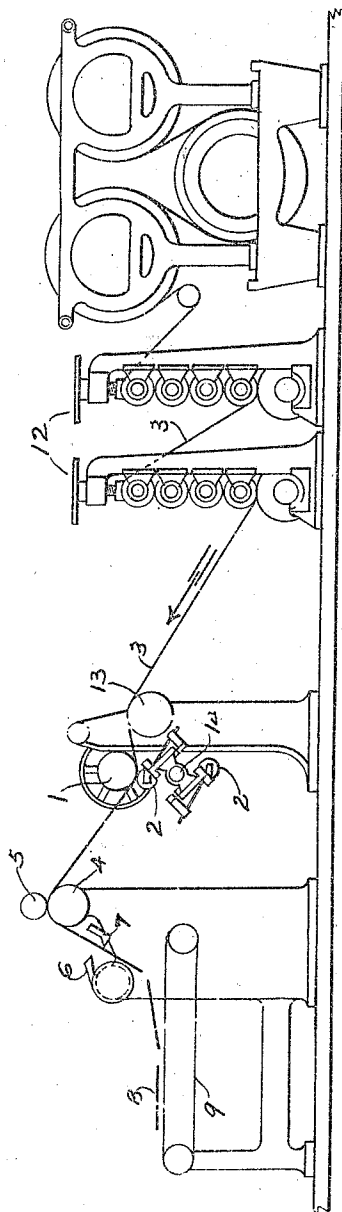
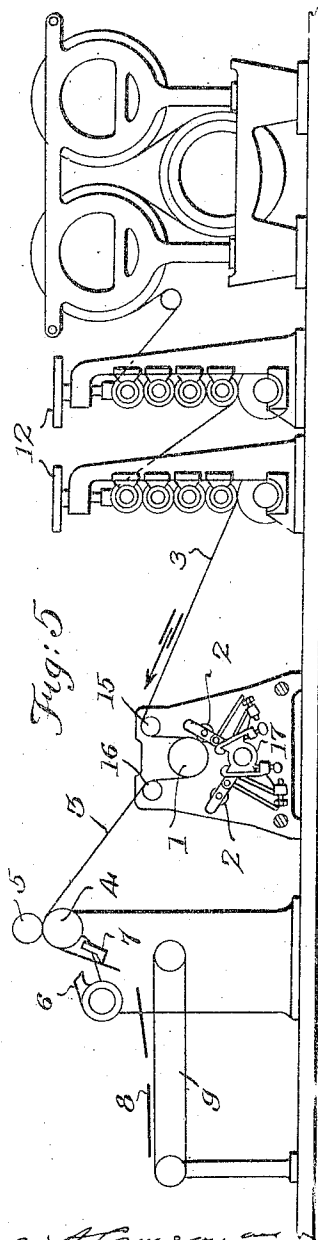


Fig: 5



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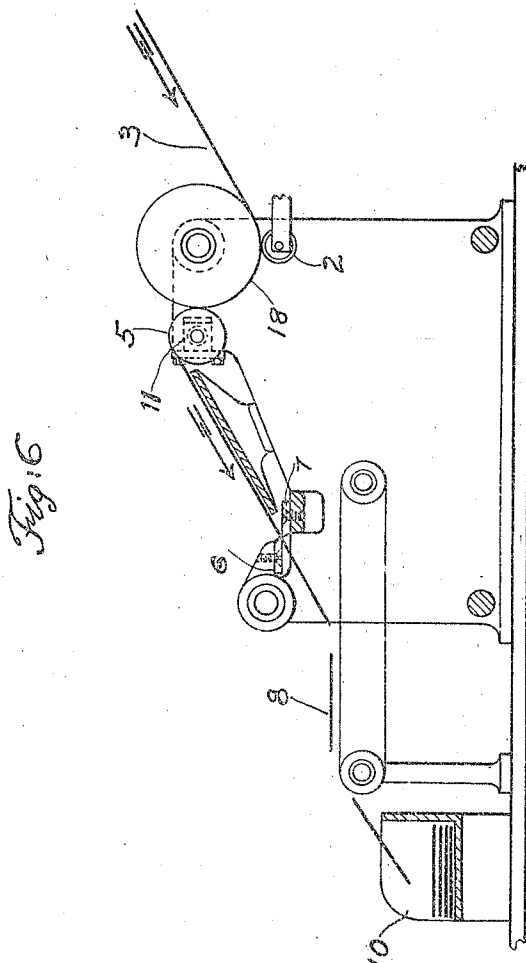
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MECHANISM FOR CONVERTING A WEB OF FLEXIBLE MATERIAL INTO SHEETS

Filed Nov. 21, 1924

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

JAMES A. CAMERON, OF BROOKLYN, NEW YORK, AND ROBERT McC. JOHNSTONE, OF ROSELLE PARK, NEW JERSEY, ASSIGNORS TO CAMERON MACHINE COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

MECHANISM FOR CONVERTING A WEB OF FLEXIBLE MATERIAL INTO SHEETS.

Application filed November 21, 1924. Serial No. 751,410.

To all whom it may concern:

Be it known that we, JAMES A. CAMERON, a citizen of the United States, and a resident of New York city, in the borough of Brooklyn, county of Kings, and State of New York, and ROBERT McC. JOHNSTONE, a citizen of the United States, and a resident of Roselle Park, in the county of Union and State of New Jersey, have invented a certain new and useful Mechanism for Converting a Web of Flexible Material into Sheets, of which the following is a specification.

This invention relates to a machine for converting a web of flexible material, such as paper board, into sheets.

Paper board, like other paper, is made by a continuous process and comes from the paper making machine, or the calendering rolls thereof, in the form of a continuous web. The web is then slitted longitudinally into sections and the latter are then severed transversely so that a constant stream of boards or sheets issues from the machine. The boards or sheets thus produced have rough edges and are not truly rectangular, in consequence of which they are not, as a rule, used commercially without first trimming the edges thereof so as to remove their roughness and to square up the board itself. To carry on the trimming operation means extra expense and also results in wastage of the trim.

It is the main object and feature of this invention to convert a web of flexible material, such as paper board, into sheets that are substantially rectangular and devoid of rough edges without the necessity of trimming them.

The invention consists primarily in using score-cut slitting devices to cut a web longitudinally into sections without distorting the sections out of parallelism, in employing feeding devices that engage the sections to exert an equal pull on all the sections to thereby advance them in parallelism, and in employing severing devices to cut the sections substantially at right-angles to their longitudinal advance. Other features of invention will appear as the specification proceeds.

The invention is disclosed in several con-

crete and preferred forms in the accompanying drawings in which:

Fig. 1 is a more or less diagrammatic side view, partly in section on the plane of line 1—1 of Fig. 2, of a combined slitting and sheeting device embodying one form of the invention.

Fig. 2 is a top plan view of Fig. 1.

Fig. 3 is an end view of the slitting means shown in Figs. 1 and 2.

Fig. 4 is a more or less diagrammatic side view of a modified form of the invention.

Fig. 5 is a more or less diagrammatic side view of a second modified form of the invention.

Fig. 6 is a more or less diagrammatic side view, partly in section, of a third modified form of the invention.

Referring first to Figs. 1, 2 and 3, the slitting devices consist of a rotatable smooth-faced backing member 1 having a "glass-hard" surface against which acts score-cut slitters 2, driven by friction from member 1. The web 3 as it comes from the paper making machine or board mill is led between the slitting elements which cut the web longitudinally and the sections are then led to a suitable feeding device consisting here of pull rolls 4 and 5, after which the sections pass between rotating knife 6 and stationary knife 7 that constitute the transverse severing device and which acts to sever the sections transversely into sheets or boards 8 that then drop on belt 9 and are conveyed to hopper 10.

The score-cut slitting device acts to cut the web longitudinally into sections without distorting said sections out of parallelism. This is different from a construction employing a shear-cut slitting device, as heretofore used in sheeting machines, in that the shear-cut device, which consists of overlapping circular shears, necessarily distorts the web sections out of parallelism, as a result of which they cannot advance in parallelism to knives 6 and 7 and said knives cannot therefore sever the web sections to produce rectangular sheets. Another disadvantage of the shear-cut slitters is that the edges of the sheets produced are rough, but this difficulty is entirely overcome by the score-cut slitters which produce smooth

edges. The pull roll 4 is here a driven element and roll 5 may be simply a pressure roll mounted in open bearings 11, the action of these rolls being to advance the web sections in parallelism to knives 6 and 7 so that transverse severance may be as nearly rectangular as possible to the longitudinal cut produced by the slitting means.

Preferably the surface speed of pull roll 4 and of backing roll 1 are identical, that is, they should be as nearly alike as possible. This is accomplished, in the present case, as follows: Pull roll 4 is positively driven and rotatable backing roll 1 is driven by traction of the advancing web, but, if desired, a light driven belt may assist backing roll 1 to rotate, its speed, nevertheless, being preferably governed by the advancing web. It will be seen that, in this manner, the speed of the pulling and the slitting means may be accurately coordinated. This it is not possible to do with a shear-cut device even if they are positively geared, because the diameter of the several cutters will be different owing to uneven wear and grinding, the consequence being that the amount of overlap will be different and therefore different speeds will be imparted to the edges of the different web sections. The shear cutters therefore will not merely distort the sections out of parallelism but will also affect the speed of the several sections differently and will, in addition thereto, tear the board to compensate for the difference in speed. All these objectionable features are avoided by the present device.

When it is desired to change the length of the sheets produced the frequency of rotation of knife 6 is varied in the usual manner. Change in width of the sheet is effected by adjusting score-cut slitters 2 transversely of backing roll 1 in a manner well understood.

In Fig. 4, web 3 is shown passing through the drying and calendering rolls 12 of a board mill after which it passes over guide 13 and between backing roll 1 and score-cut slitters 2. From thence it passes between pulling rolls 4 and 5, and thence to knives 6 and 7. Score-cut slitters 2 are here mounted on a rotatable member 14 and there are two sets of them so that one set can be adjusted while another set is operating. The machine shown in Fig. 4 is disclosed and claimed in application Ser. No. 678,333, filed Dec. 3, 1923.

In Fig. 5 the disclosure is substantially the same as in Fig. 4 except that the web passes over guide 15 of the slitter, then around backing roll 1, then over guide 16 and thence to the pulling rolls. Score-cuts slitters 2, of which there are two sets, are here mounted on a rocking member 17 so that when one set is thrown out another is thrown in. In this case also one set of cutters can be adjusted while another set of cut-

ters are adjusted so that the change from one size to another can be effected without interrupting the flow of the web. The machine shown in Fig. 5 is disclosed and claimed in application Ser. No. 678,332, filed December 3, 1923.

In Fig. 6 is shown a modification of the form of the invention shown in Fig. 1. As there shown driver roll 18 constitutes a backing roll for the score-cut slitters 2, and it also constitutes a pulling roll coacting with pulling roll 5 to feed the paper through the machine. The form of the invention shown in Fig. 6 is claimed specifically in application Ser. No. 20,334, filed April 3, 1925.

We claim:

1. Mechanism for converting a web of flexible material into sheets including: score-cut slitting means to cut a web throughout into longitudinally independent sections without distorting the sections out of parallelism, a feeding device engaging the sections to exert an equal pull on all the sections to thereby advance them in parallelism, and severing devices to cut the sections, simultaneously into a plurality of sheets substantially at right angles to their longitudinal advance.

2. Mechanism for converting a web of flexible material into sheets including: score-cut slitting means to cut a web throughout into longitudinally independent sections without distorting the sections out of parallelism, pulling rollers engaging the sections to exert an equal pull on all the sections to thereby advance them in parallelism, and severing devices to cut the sections, simultaneously into a plurality of sheets, substantially at right angles to their longitudinal advance.

3. Mechanism for converting a web of flexible material into sheets including: score-cut slitting means to cut a web throughout into longitudinally independent sections without distorting the sections out of parallelism, a feeding device operating at substantially the same surface speed as the slitting means, engaging the sections to exert an equal pull on all the sections to thereby advance them in parallelism, and severing devices to cut the sections, simultaneously into a plurality of sheets substantially at right angles to their longitudinal advance.

4. Mechanism for converting a web of flexible material into sheets including: slitting means comprising: smooth-faced rotatable backing means and score-cutters engaging and frictionally driven from said backing means, to cut a web longitudinally into sections without distorting the sections out of parallelism, a feeding device engaging the sections to exert an equal pull on all the sections to thereby advance them in parallelism and to drive said backing means by traction of the advancing web, and sever-

ing devices to cut the sections substantially at right angles to their longitudinal advance.

5 5. Slitting means including: smooth-faced rotatable backing means, score-cutters engaging and frictionally driven from said backing means, and a feeding device for advancing a web by pulling it between the backing means and score-cutters and for
10 driving said backing means by traction of the advancing web.

6. Slitting means including: smooth-faced rotatable backing means, score-cutters engaging and frictionally driven from said
15 backing means, and pulling rollers for advancing a web by pulling it between the

backing means and score-cutters and for driving said backing means by traction of the advancing web.

7. Mechanism for converting a web of 20 flexible material into sheets including: slitting means having as one of its members a cylindrical-surfaced roll around which the web passes, a feeding device to exert an equal pull on all the sections later- 25 ally, and a severing device for cutting the web sections transversely.

Signed at New York city, in the borough of Brooklyn, county of Kings and State of New York, this 17 day of November, 1924.

JAMES A. CAMERON.

ROBERT McC. JOHNSTONE.