

Aug. 10, 1937.

F. KÄPPLER

2,089,898

PRODUCTION OF CORRUGATED CARDBOARD

Filed Aug. 14, 1935

2 Sheets-Sheet 1

Fig. 1

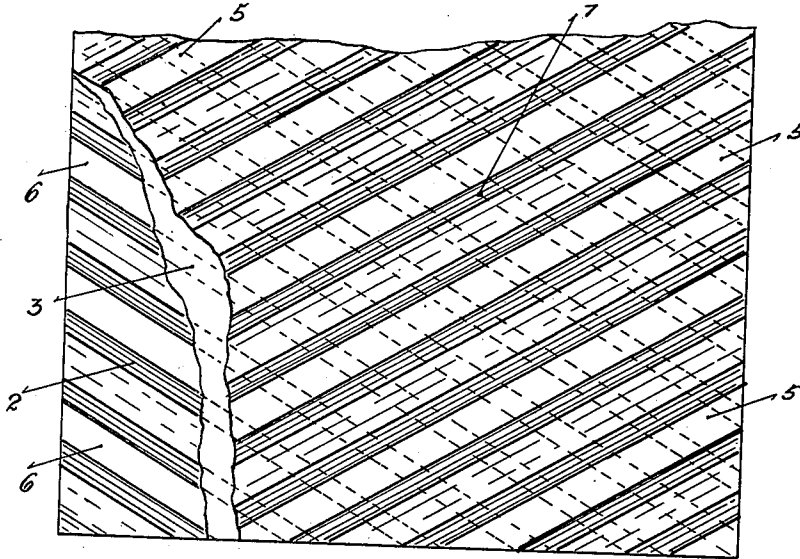


Fig. 2

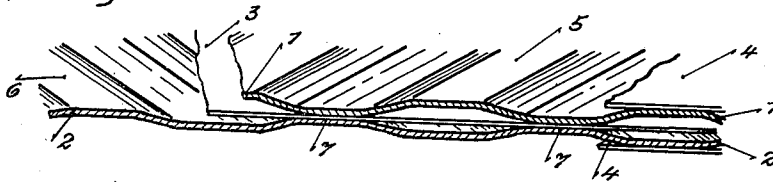
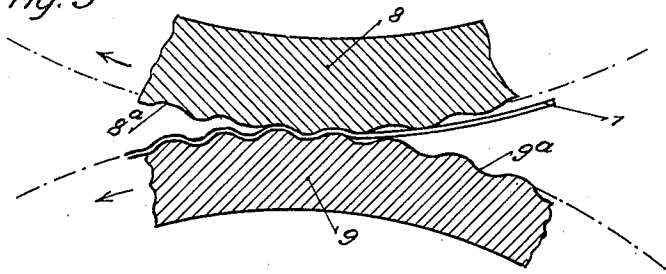


Fig. 3



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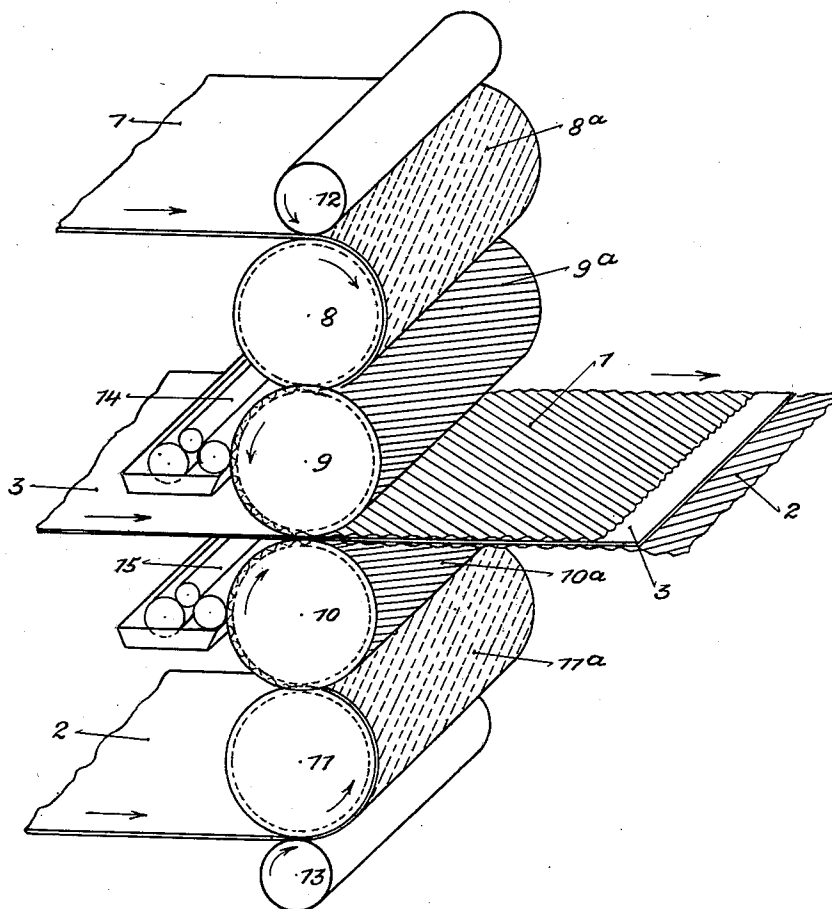
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Fig. 4



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UNITED STATES PATENT OFFICE

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PRODUCTION OF CORRUGATED CARD-BOARD

Felix Käppler, Freiberg-in-Saxony, Germany

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In Germany August 17, 1934

1 Claim. (Cl. 154—30)

This invention relates to a method and device for producing cardboard with embossed corrugations for use in making packing-cases.

The cardboard according to the invention can be made from paper, board or similar materials and is provided with embossed corrugations extending obliquely to the edges on both sides of the cardboard. Owing to its strength, the cardboard thus made can be used for producing cartons, packing-cases and other containers for despatch by parcel-post, railroad or ship.

Compared with existing methods of producing board with oblique corrugations, chiefly from thinner papers, the method according to the invention employs mainly cardboard having little body and a good feel like grey cardboard. In this cardboard the oblique corrugations are produced in a novel manner by means of helically milled rollers of known type in such a way that the material required for forming the ridges is obtained by drawing-like stretching and displacement. The action of the apparatus employed to carry out the present method is to produce a stretching of the papers, as well as a flexural deformation. Each elementary infinitesimal square on the surface of the original web is stretched in its own plane to form an oblique trapezoid so that the original and final webs will be parallel after a single pass.

In the production of obliquely corrugated board by means of helically milled rollers the difficulty arises that during the corrugating process the web of paper is gradually laterally deflected owing to the rotation of the rollers.

The invention overcomes this trouble by employing in addition to the known pair of helically milled embossing rollers a third roller which, prior to the embossing step, presses the web of material to be treated against one of the rollers of the pair and thus guides it for continuous operation without any chance of deflection.

By way of example, the invention is illustrated in the accompanying drawings, in which Figure 1 shows a piece of cardboard in elevation; Fig. 2 is a cross section of a piece of cardboard; Fig. 3, a partial view of a pair of helically milled rollers with embossed and plain cardboard pieces in cross section; and Fig. 4, a diagrammatic view of the device.

The oblique corrugations 5 are formed by pressing the web of cardboard 1 under heavy pressure between the heatable rollers 8 and 9, Figs. 3 and 4, provided with helically milled depressions and ridges 8a on roller 8 and 9a on roller 9, Fig. 3, which accurately correspond with one another, the web of cardboard being drawn and stretched so as to produce the flat corrugations 5 and 6, as indicated in Figs. 1 to 3. Owing to the arrangement of the plain roller 12 which presses the web 1 against the embossing roller 8, the web 1 is held taut during the rotary embossing step to insure perfect embossing and to prevent any deflection of the moving web. The helically milled depressions of the embossing rollers may have any shape and depend on the thickness of the cardboard worked.

The cardboard shown in Fig. 1 is produced by the device shown in Fig. 4 as follows:

The plain webs 1 and 2 are passed from the plain rollers 12 and 13 to the heatable embossing rollers 8 and 11 and rotatably embossed under heavy pressure by means of the heatable rollers 9 and 10. After an insulating agent has been applied to the corrugated webs 1 and 2 by suitable means and also an adhesive by the mechanisms 14 and 15, the plain web 3 is united with the corrugated webs 1 and 2 under heavy pressure exerted by the roller group 9, 8, 12 upon the roller 10. The cardboard thus obtained comprising two corrugated webs and a plain intermediate web may be further moved in the same direction to be fitted with a plain paper web on each side by known means. The device according to the invention can further be used for producing a cardboard having only one corrugated web and two plain webs by feeding only the web 1 with the intermediate web 3 to the device and then applying the second plain web.

I claim:—

A device for carrying out the method described, comprising a pair of helically milled heatable embossing rollers and a plain roller cooperating with said pair of rollers for pressing the web of material to be embossed, prior to embossing, against one of the embossing rollers and guiding the web for continuous operation without permitting deflection thereof.

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