

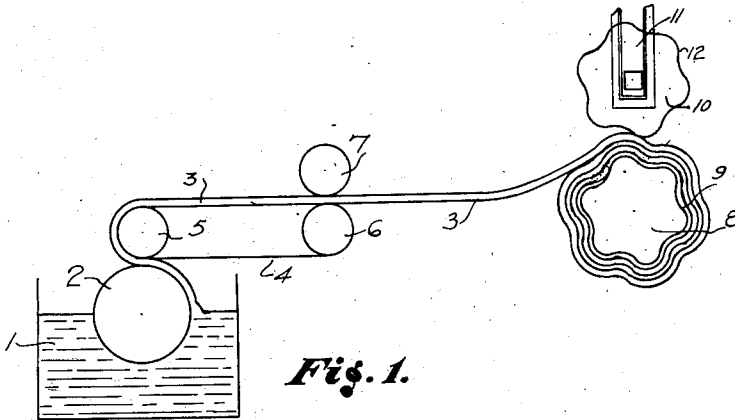
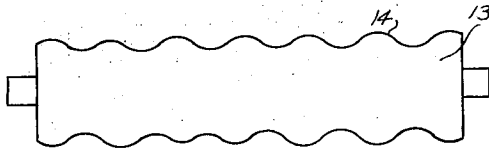
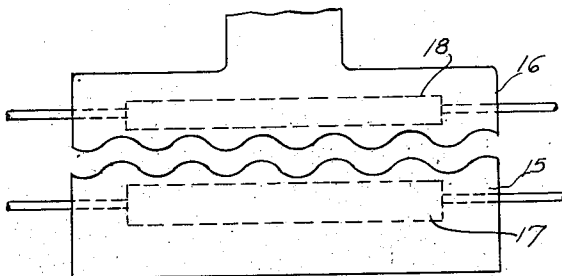
Aug. 18, 1925.

1,550,648

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PROCESS OF MAKING CORRUGATED SHEETS

Filed Dec. 16, 1920



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Patented Aug. 18, 1925.

1,550,648

# UNITED STATES PATENT OFFICE.

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## PROCESS OF MAKING CORRUGATED SHEETS.

Application filed December 16, 1920. Serial No. 431,098.

*To all whom it may concern:*

Be it known that I, RAY P. PERRY, a citizen of the United States, residing at 22 Parkside, Upper Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Processes of Making Corrugated Sheets, of which the following is a specification.

One of the objects of this invention is to produce a corrugated sheet or board which shall be free from weak spots and which shall be substantially homogeneous or uniform throughout its entire extent. Another object of this invention is to produce a corrugated sheet containing felted fibrous material in which no substantial portion of the fibers is torn apart after having once been felted together. Other objects and advantages of this invention will be obvious as the description proceeds.

In practicing this invention a thin sheet is formed, containing fibrous and waterproofing material, on an ordinary paper-making machine, by introducing particles of comminuted waterproofing material into the paper pulp and permitting the same to become incorporated in the sheet as the same is formed on the perforated cylinder of the paper-making machine. This sheet, containing the fibrous and waterproofing material, while still wet is laid or wrapped upon a corrugated surface so as to form the corrugations without tearing the fibers apart. The folding or wrapping of the successive layers while still wet causes the fibers on the surfaces to mat or felt together, thus producing an initial joining of the same into an integral body. The product thus formed may be then be dried and pressed under great pressure and at high temperature between the corrugated plates of a press so as to melt or fuse the waterproofing material and cause the product to be firmly united into a stiff, rigid body.

The invention will be understood from the description taken in connection with the accompanying drawings, in which

Fig. 1 is a side view of a machine for making the sheet.

Fig. 2 is a side view of a different sort of corrugated mandrel for use in the process.

Fig. 3 is a side view of a press in which the corrugated sheet may be pressed.

In the drawings reference character 1 in-

dicates the vat of an ordinary paper-making machine, in which the cylinder 2 revolves, and upon which the sheet 3 is formed and picked up by the wet blanket 4 that passes over rolls 5 and 6. The material introduced into the vat 1 comprises fibrous material, such as paper-making stock, and comminuted particles of waterproofing material out of which the sheet 3 is formed. The sheet 3 may be passed between squeeze-rolls 6 and 7 to press out of the same a part of the water, after which the sheet may be made to pass around a mandrel 8 provided with a series of longitudinal ribs or corrugations 9. The sheet 3 may be made to assume more nearly the shape of the corrugations 9 by means of a correspondingly corrugated press-roll 10, which slides in guideways 11. The corrugations 12 of the press-roll 10 press the convolutions of the sheet 3 so that the same assume the shape of the outside of the mandrel 8, as indicated in Fig. 1. The wet state of the sheet 3 enables the same to be bent into the proper shape and also causes the fibers to mat or felt, as above mentioned. When sufficient turns have been made to produce a corrugated article of the proper thickness, the sheet 3 is severed and the roll is slit along a longitudinal line and spread out flat. It is obvious that the mandrel 8 can be made of sufficient diameter so that the internal and external diameters of the corrugated roll do not differ from each other sufficiently to cause serious distortion of the fibers when the roll is slit and spread out flat.

Instead of wrapping the sheet on a mandrel with longitudinal corrugations, as indicated in Fig. 1, the same may be wrapped or wound upon a mandrel 13, as indicated in Fig. 2, which has circumferential corrugations 14, thus causing the corrugations of the sheet 3 to be parallel with the fibers of the sheet instead of being across the fibers, as would be the case with the mandrel 8, as shown in Fig. 1. A correspondingly press-roll may be used with the roll 13, if necessary, to insure the proper conformation of the corrugations. The roll wound upon the mandrel 13 may, when sufficient convolutions have been made to form the proper thickness, be slit longitudinally and spread out flat.

Instead of wrapping or winding the sheet 3 upon a corrugated mandrel, the same may

be folded back and forth upon itself upon a flat plate having on its face the proper convolutions, and the sheet may be caused to fit the convolutions by running a properly corrugated roll over the surface of the same.

The flat sheets may be and preferably are further dried and placed between the members 15 and 16 of the hydraulic press shown in Fig. 3. The member 15 may be provided with a hollow chamber 17 and the member 16 may be provided with a hollow chamber 18, into which chambers heating or cooling fluids may be introduced. When the flat sheet above described is introduced between the members 15 and 16 of the press, the same may be heated by passing heating fluid into the chambers 17 and 18 sufficiently to melt the waterproofing material, and pressure may be applied, thus causing an intimate union of the layers into a substantially homogeneous and integral body. While the pressure is still applied the heating fluid may be turned off and cooling fluid run into the chambers 17 and 18, thereby causing the waterproofing material to "set", thus producing a hard and rigid corrugated product that will permanently retain its shape.

It has been found in practicing this invention that articles suitable for certain purposes can be made as above described by making sheets containing pitch as the waterproofing material, which pitch may have a melting point from about 250° F. to 300° F. The pitch may be about 50% to 90% of the total weight of the finished product.

I claim:

1. The process which comprises forming a sheet containing fibrous material and comminuted bituminous material, and superposing a plurality of layers of said sheet on

each other, one at a time while wet upon a corrugated surface.

2. The process which comprises forming a sheet containing fibrous material and comminuted bituminous material, superposing a plurality of layers of said sheet on each other, one at a time while wet upon a corrugated surface, and drying and pressing the same to form a corrugated product.

3. The process which comprises forming a sheet containing fibrous material and comminuted bituminous material, superposing a plurality of layers of said sheet while wet upon a corrugated surface, and drying and hot pressing the same to form a rigid corrugated product.

4. The process which comprises forming a sheet containing fibrous material and comminuted bituminous material, superposing a plurality of layers of said sheet while wet upon a corrugated surface, drying the layers, melting the bituminous material, and pressing the product in a hot press having corrugated faces.

5. The process which comprises forming upon a papermaking machine a sheet containing fibrous material and pitch, and superposing a plurality of layers of said sheet on each other, one at a time while wet upon a corrugated surface.

6. The process which comprises forming a sheet containing fibrous material and comminuted bituminous material, and superposing a plurality of layers of said sheet upon a corrugated surface and pressing each layer into corrugations before the next one is applied.

In testimony whereof I affix my signature.

RAY P. PERRY.