Dec. 25, 1934. L. E. SHAW 1,985,300

METHOD OF EMBOSSING

Filed March 4, 1931

Fig. 1.

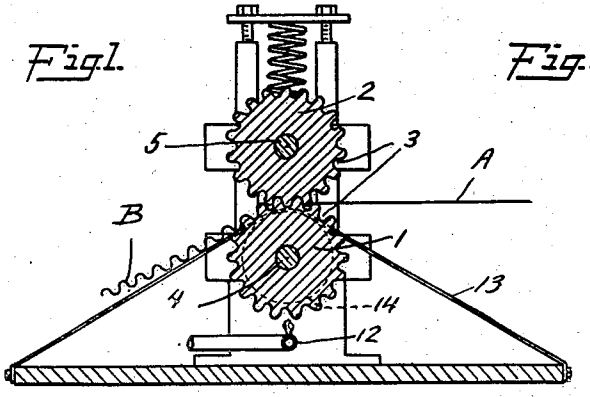


Fig. 3.

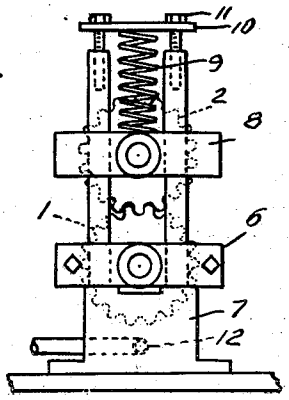


Fig. 2.

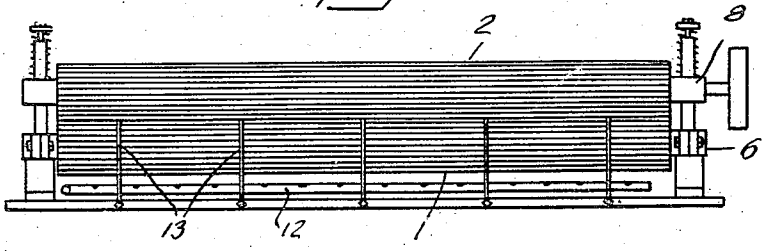


Fig. 4.

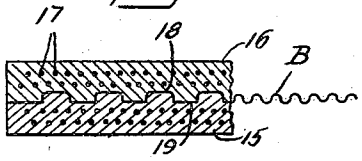


Fig. 8.

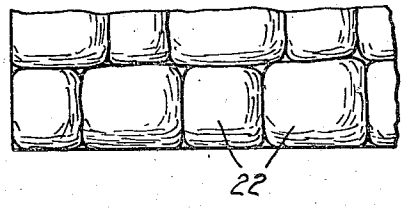


Fig. 5

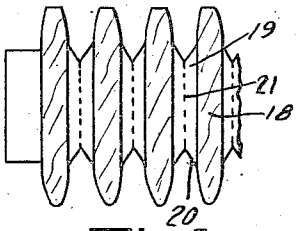


Fig. 6.

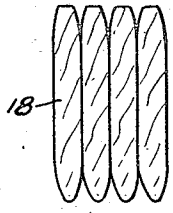
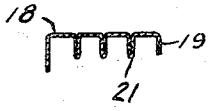


Fig. 7.



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METHOD OF EMBOSSING

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Application March 4, 1931, Serial No. 520,067

7 Claims. (Cl. 101—32)

This invention relates to methods of embossing and more particularly to methods of making deep embossings.

In embossing fibrous sheets the raised portion of the embossing is generally formed from a flat sheet necessitating stretching of the fibers and thus weakening the structure. The depth of the embossing is thus limited by the ability of the fibrous sheet to stretch without tearing. In making various types of embossings the embossed structure is of great depth and great care must be exercised to prevent tearing of the sheet. Thus, in the display device of the character described and claimed in the application of Rudolph M. Sanders, Serial No. 460,931, filed June 13th, 1930 it is very difficult to obtain the desired depth of embossing from a flat sheet.

In the present invention I obtain deep embossings by providing a corrugated sheet or a sheet having an irregular surface. This provides additional material from which the embossings may be formed and results in less stretching of the sheet and therefore less liability of tearing.

In the accompanying drawing I have illustrated my improved method of embossing together with suitable apparatus for corrugating flat sheets. In the drawing:

Fig. 1 is a vertical, sectional view of the corrugating apparatus;

Fig. 2 is a front elevation thereof;

Fig. 3 is an end elevation thereof;

Fig. 4 is a detailed, sectional view of an embossing die;

Fig. 5 is a plan view of an embossed member simulating a row of cigars prior to folding;

Fig. 6 is a similar view of the embossed member in folded position;

Fig. 7 is a detailed, sectional view thereof; and

Fig. 8 is an embossed member simulating a layer of candy.

Referring to Figs. 1 to 3 of the drawing, the corrugating apparatus comprises a pair of rolls 1 and 2 provided with corrugating grooves 3 in their surfaces. The rolls are mounted on shafts 4 and 5 arranged in suitable bearings. The bearings 6 of the lower shaft are rigidly mounted in suitable end members or standards 7 and the bearings 8 of the upper shaft are slidably mounted in the end members and are adapted to be adjusted to desired pressures by means of springs 9. These springs are provided with followers 10, the position of which may be adjusted by means of threaded bolts 11 received in the upper ends of the standards whereby the pressure of the spring may be regulated. A burner pipe 12 is arranged beneath the lower roller 1 to heat the roller and thus cause the paper or other fibrous sheet to be heated and facilitate corrugating of the sheet. A series of stripper wires 13 extend over the lower roll being mounted in suitable circumferential grooves 14 therein. A sheet A is fed through the corrugating rolls as shown in Fig. 1 of the drawing to produce a corrugated sheet B.

Referring to Figs. 4 to 7 of the drawing, the corrugated sheet B may be employed for the purpose of simulating a row of cigars to produce a display device adapted to be arranged in a cigar box in the position normally occupied by the top row of cigars as described and claimed in the Sanders application referred to above. An embossing die comprising a lower member 15 and an upper member 16 is adapted to form a series of embossings having the appearance of the exposed portions of individual cigars. As shown, the die may be heated by heating wires 17 arranged therein. It will be apparent to one skilled in the art that the amount of material between two of the individual representations 18 of a cigar in the completed embossed product is greater than the amount of material occupied by a flat sheet of the same width and when the embossings are made from a flat sheet considerable stretching of the fibrous sheet is necessary. By employing the corrugated sheet B, I provide additional material which is reshaped to form the embossing with considerable less stretching and therefore less liability of tearing.

In Fig. 5 of the drawing, I have shown an embossed sheet with the unembossed material 19 between the individual representations of the cigars cut or trimmed as at 20 and scored as at 21 to permit folding. The sheet is then folded as shown in Fig. 6 and 7 of the drawing and mounted on a suitable support.

In Fig. 8 of the drawing I have shown the invention applied to the manufacture of embossings for simulating a layer of candy or other product comprising a series of members of different sizes and shapes. In this form of the invention, I employ a sheet having corrugations or other projections in the surface thereof. Suitable embossing dies are substituted for the die shown in Fig. 4 to produce the desired form in the embossed sheet. Fig. 8 is a plan view of the product wherein the simulations of the individual candies are indicated at 22. The embossed product is made in substantially the same manner heretofore described in connection with the simulation of cigars, the die sections 15 and 16 being suitably

shaped to produce the individual embossings 22. It will be apparent that in producing the individual embossings 22 from a flat sheet considerable stretching of the fibrous sheet would be necessary whereas an excess of material is provided by corrugations or other projections which permits the formation of these embossings with considerable less stretching of the sheet.

In the claims the term "projections" is used to indicate any construction or form of sheet in which a portion of the fibrous sheet is offset or arranged out of the plane of the flat sheet to provide a greater amount of material for embossing than would be provided by a flat sheet of the same width, and it is to be understood that while the new method of embossing has been described as applied to forming display devices, this use is merely illustrative, the invention being applicable to forming on any sheet surface projections whose formation involves the use of surplus material to avoid rupturing the sheet.

I claim:

1. The method of embossing which comprises corrugating a flat sheet without increasing the surface area thereof, placing the corrugated sheet in an embossing die and embossing said sheet to re-form the corrugations into embossings of different nature and form and with substantially smooth unbroken surfaces.

2. The method of embossing which comprises deforming a sheet to increase the amount of material in a given area without materially stretching the material of the sheet, placing said sheet in an embossing die and embossing said sheet to re-form the deformations into embossings of different nature and form and with substantially smooth unbroken surfaces.

3. The method of embossing which comprises deforming a sheet to decrease the projected area of the deformed part without materially increasing the surface area of the deformed part, and embossing the sheet to produce embossings of different character than the deformations but located substantially at the original deformations and having smooth unbroken surfaces.

4. The method of embossing, which comprises providing a sheet with a plurality of projections differing in character from the character of the embossing to be formed on the sheet, and embossing the sheet to re-form the projections into embossings having substantially smooth unbroken surfaces.

5. The method of embossing, which comprises forming a sheet with parallel corrugations, and embossing the sheet by re-forming the corrugations into parallel embossings of different nature and form but extending substantially in the direction of the original corrugations and having substantially smooth unbroken surfaces.

6. The method of embossing, which comprises forming a sheet with projections, and embossing the sheet by re-forming the projections into embossings of different nature and form, the surplus material provided by the projections preventing rupture of the material by accommodating the difference in form of the embossings as compared to the projections.

7. The method of embossing sheet material with a die, which comprises deforming a sheet to conform its surface area to the surface area of the die, and embossing the deformed sheet with the die without increasing the surface area of the embossed sheet, whereby the surfaces of the embossings thus formed are substantially smooth.

LOUIS E. SHAW.