

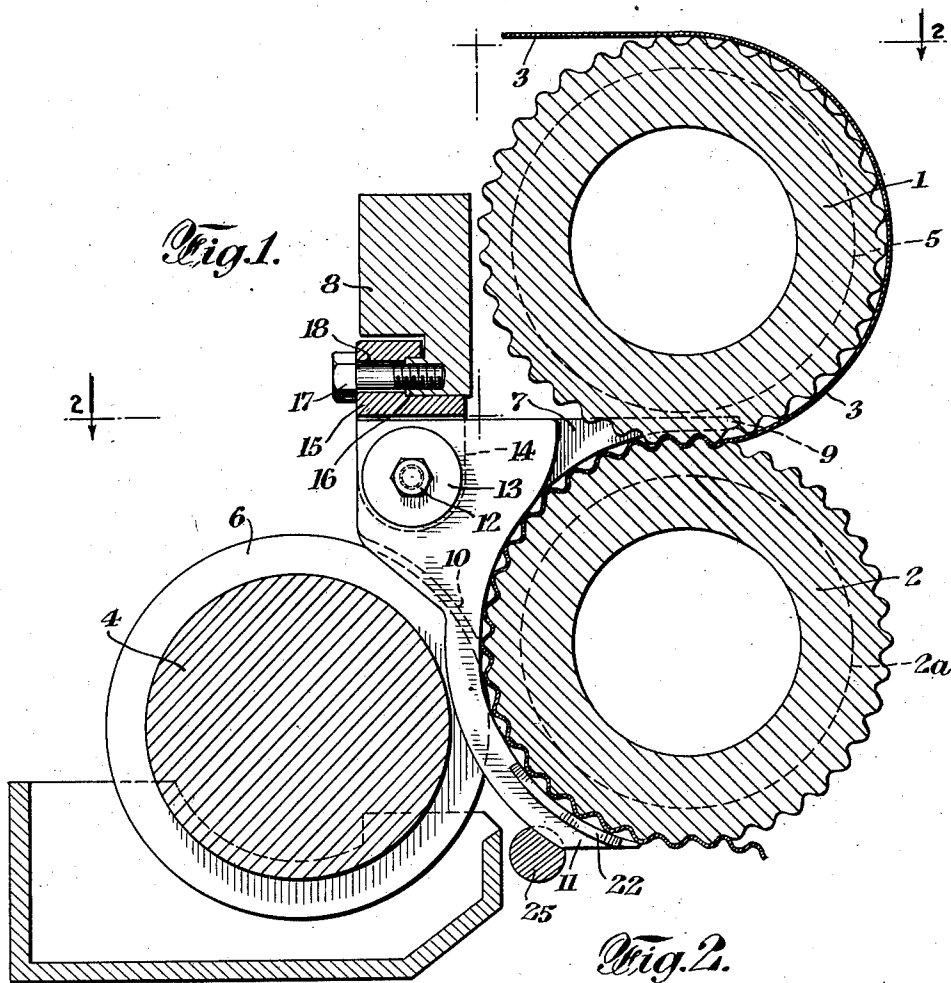
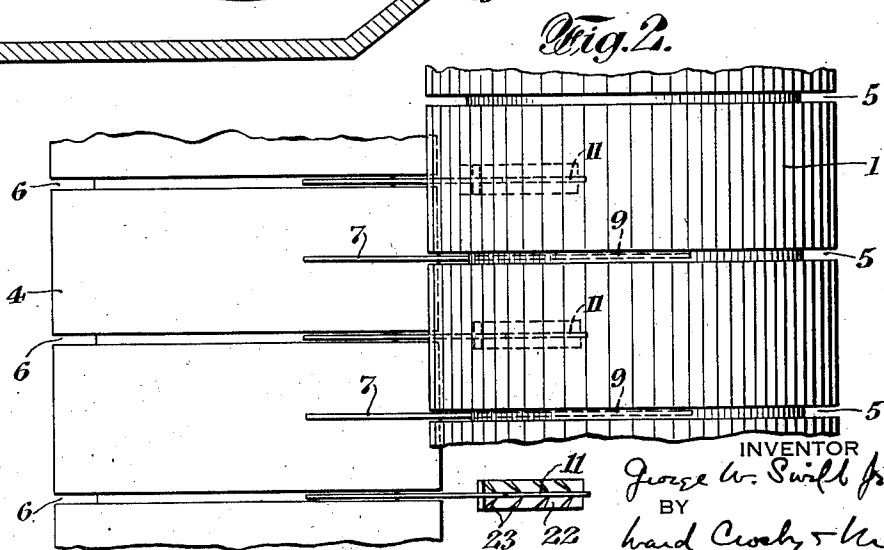
June 9, 1936.

G. W. SWIFT, JR
CORRUGATING MACHINE

2,043,635

Filed April 12, 1935

2 Sheets-Sheet 1



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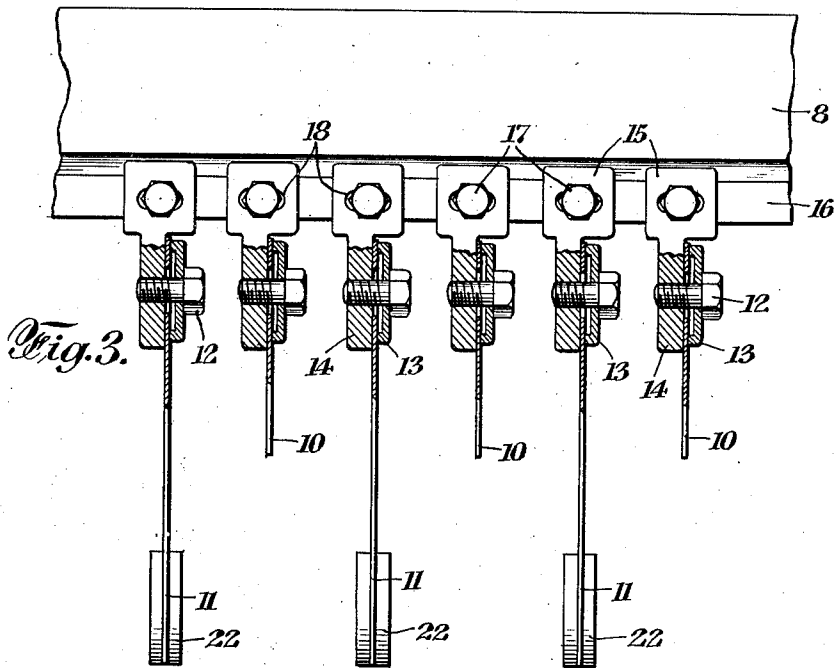
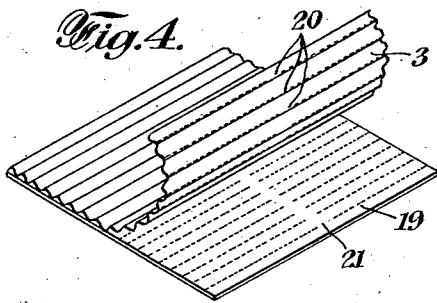
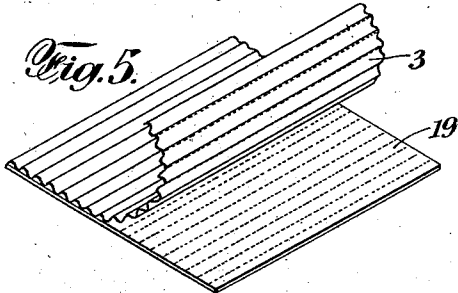
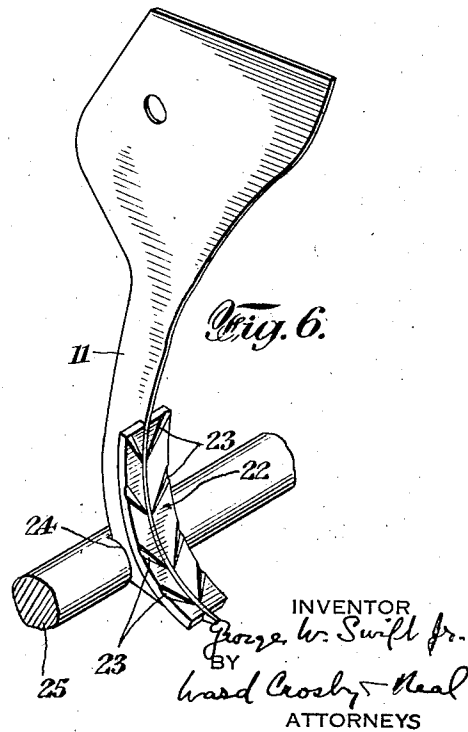
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2,043,635

CORRUGATING MACHINE

Filed April 12, 1935

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,043,635

CORRUGATING MACHINE

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Application April 12, 1935, Serial No. 15,971

9 Claims. (Cl. 154—30)

The invention relates to corrugating machines of the type used in the production of corrugated paper, wherein the so-called liner sheet to be corrugated is fed in between a pair of meshing corrugating rolls; and while passing around with one of said rolls after the corrugating step the liner is fed past an adhesive-applying roll which contacts with and applies sodium silicate or other suitable adhesive to the peaks of the corrugations, after which a facing sheet is brought into contact with the above mentioned peaks of the corrugations. In the operation of machines of the above type it is desirable to provide stripper members operating in grooves in the rolls to separate the corrugated paper from one of the corrugating rolls and guide it to travel partially around with the other corrugating roll past the point where the adhesive-applying roll applies adhesive to the peaks of the corrugations, as well as to guide the corrugated web to travel further along with the second mentioned corrugating roll after the adhesive-applying operation has been completed.

The present invention aims to improve the machine in respect to the stripping and guiding members employed for the above purposes and to reduce imperfections in the corrugated product as caused by the relatively wide grooves which heretofore have been provided in the adhesive-applying rolls to accommodate prior stripper member constructions, which resulted in relatively wide areas on the peaks of the corrugations to which adhesive was not applied to bond properly with the facing sheet.

Another object of the invention is to provide for the application of adhesive to the areas on the peaks of the corrugations which otherwise would be bare of adhesive on account of the above mentioned grooves in the adhesive-applying rolls.

Another object of the invention is to avoid undue strains on the stripper members during the expansion and contraction of the corrugating rolls which is caused by changes in the amount of heat applied thereto, and otherwise to simplify and improve the construction of the stripper members.

Further objects and advantages of the invention however will be in part obvious and in part specifically referred to in the description herein-after contained which, taken in conjunction with the accompanying drawings, discloses a preferred embodiment of the invention; such embodiment however is to be regarded as merely illustrative of the principles of the invention. In the drawings—

Fig. 1 is a vertical sectional view of a corrugating machine constructed in accordance with the invention, only the parts of the machine being illustrated with which the invention is particularly concerned.

Fig. 2 is a top plan view with certain portions cut away, of the parts of the machine which appear in Fig. 1.

Fig. 3 is a detail view showing separately the stripper members and their support.

Figs. 4 and 5 illustrate the differences in the product obtained respectively without and with the use of an adhesive-applying member such as forms one feature of the present invention.

Fig. 6 shows such an adhesive-applying member detached from the remainder of the machine.

The invention is disclosed as applied to a corrugating machine of known type as to many of its features of construction and mode of operation and since this, as well as other corrugating machine constructions suitable for the purpose, are well known in the art, only the particular parts of the machine will be referred to with which the present invention is more directly concerned. I have shown in the drawings a pair of meshing corrugating rolls 1 and 2 which will be understood as heated in suitable manner and supported and driven as is known in the art. The liner sheet 3 after passing partially around the first corrugating roll 1, passes in between rolls 1 and 2 where the corrugating step is performed, and the corrugated web then passes around with the roll 2 past an adhesive-applying roll 4 supported and driven in suitable manner (not illustrated) and which applies a suitable adhesive—usually a silicate of soda solution—to the peaks of the corrugations of web 3 as the latter is carried by roll 2 past adhesive-applying roll 4.

To separate the corrugated web 3 from roll 1 and cause it to be carried around with roll 2, until and after the adhesive has been applied as above mentioned, stripper members have been employed which project into circumferential grooves 5 in roll 1, and also into a similar series of circumferential grooves 6 in the adhesive-applying roll 4, these grooves 5 and 6 when employed according to prior practice being aligned, and the stripper fingers each running in both grooves and somewhat beyond the roll 4 to insure that the corrugated web will be kept in the corrugations of the second corrugating roll, until a facing sheet is applied to the sticky peaks of the corrugations in a manner well known in the art and not shown or described herein. The corrugating roll 2 will

usually have circumferential grooves 2a to receive stripping fingers (not illustrated) for separating the single-faced paper thus formed from roll 2, but with this phase of the machine the present invention is not particularly concerned.

In accordance with the present invention the corrugated web is separated from roll 1 and initially guided to pass around with roll 2, by a set of stripper members 7 carried by a stripper member support 8, preferably located above roll 4 and extending transversely across the machine substantially parallel to the roll 1. These stripper members 7 having finger-like portions 9 which penetrate into the grooves 5 of roll 1 adjacent the part of such roll which is intermeshing with the second corrugating roll 2, and the stripper members 7 also extend partially around the periphery of roll 2 toward the adhesive-applying roll 4, but as indicated at 10 the stripper members 7 terminate before reaching the adhesive-applying roll, thus leaving them interengaged with roll 1 but entirely free of roll 4.

In the illustrated form of the invention the stripper members 7 are adjustably attached by bolts 12 and clamps 13 to ears 14 on blocks 15 which are adjustable along a track 16 on support 8. Bolts 17 passing through holes 18 in blocks 15, and seated in the track 16 may be employed to hold the blocks and the stripper members 7 adjustably in position on track 16.

With a construction of the above nature, the stripper members 7 are confined as to their position transversely of the machine, only by their engagement with the grooves 5 of roll 1, and thus when the heat is turned on or off roll 1, causing the latter to expand or contract transversely of the machine, the stripper members 7 may be correspondingly shifted in position and need not be subjected to undue strains.

It is very desirable to provide a stripper member construction which will support the corrugated web and keep it in the corrugations of roll 2 while being carried past the adhesive-applying roll 4. This is of particular advantage when roll 4 is withdrawn from working position, as will happen from time to time in practical operation. For this purpose I provide a set of guide members 11 which are entirely free from the stripper members 7 above described as well as from the corrugating roll 1, these guide members 11 being extended upwardly to penetrate into grooves 6 of the adhesive-applying roll 4, and they may also be extended upwardly still further beyond the lower ends 10 of stripper members 7, and be carried by the stripper member support 8 above described. These members 11 keep the corrugated web in the corrugations of roll 2 during and after the application of adhesive by roll 4. Supporting blocks and associated parts similar to the members 12 to 18 above described may be employed for guide members 11 and they will ordinarily be held fixedly in position. And as another preferred feature of the invention in its more specific aspects, I may position the circumferential grooves 6 of the adhesive-applying roll 4, in staggered relation to the grooves 5 and stripper members 7 above described, the guide members 11 being supported from points along the support 8 which are between the stripper members 7. It should be noted that the guide members 11 are wholly unaffected by expansion and contraction of the corrugating rolls and hence the grooves 6 of roll 4 may be made very narrow in width. In other words, the adhesive-applying roll 4 not being heated will not expand

and contract materially in operation, and expansion and contraction of the corrugating rolls will impose no strains on the guide members 11, nor tend to shift them in position. The reduction in the width of grooves 6 which consequently is possible, is of substantial advantage in reducing areas on the corrugated web to which adhesive is not applied by roll 4, which results in a better bond between the corrugating liner and the facing sheet.

Heretofore where grooves of the above character have been employed in adhesive-applying rolls, the corresponding areas of the corrugations of the web have been left bare of adhesive. This is illustrated in Fig. 4 which is a perspective view of a piece of single faced corrugated paper having its corrugated liner sheet 3 partially torn away from a facing sheet 19. The above mentioned bare spots on the liner are indicated at 20 in Fig. 4, and there will be corresponding areas 21 on the facing 19 which are not bonded to the liner.

As another feature of the invention I provide for the application of adhesive to the areas along the corrugations of liner 3 which otherwise would be left bare of adhesive, because of the grooves 6 in the adhesive-applying roll 4. This may be done, for example, by providing adhesive-applying members 22 located adjacent the corrugating roll 2 in position to operate on the areas 20 of liner 3 shortly after these areas have passed grooves 6. In the illustrated form of the invention these adhesive-applying members 22 transfer or spread adhesive from adjacent areas of the peaks of the corrugated liner 3, to the areas 20 thereof, and are provided for this purpose with grooves 23 (Fig. 6) which are inclined in the direction of travel of the corrugated web, the walls of these grooves 23 thus causing adhesive to be conducted to the areas 20 on the peaks of corrugated web 3.

The corrugated product, as indicated in Fig. 5, thus has adhesive applied all the way along the corrugations of liner 3, to bond properly at all points with the facing sheet 19. These adhesive-applying members 22 may be supported on the lower ends of guide members 11 and preferably are constructed to act as guides keeping the corrugated web in the corrugations of roll 2. The above guide members are preferably held in proper position by engaging in notches 24 in a bar 25 which extends transversely across the machine.

Thus according to the present invention the corrugated web is adequately guided by the stripper members during its passage between and around the rolls as above described, but expansion and contraction of the corrugating rolls with respect to the stripper members and the adhesive-applying roll is taken care of in such a way as to avoid undue strains on the stripper members, and the construction enables a more perfect product to be produced.

Although the invention has been disclosed as carried by certain specific construction as above described, it should be understood that many changes may be made therein without departing from the invention in its broader aspects, within the scope of the appended claims.

I claim:

1. A corrugating machine having a first corrugating roll, a second corrugating roll meshing therewith, an adhesive-applying roll adjacent the second corrugating roll in position to apply adhesive to the peaks of a corrugated web passing around with the second corrugating roll, said first mentioned corrugating roll having circumferential grooves therein, a set of stripper members

penetrating into the above mentioned grooves of the first corrugating roll adjacent the portion thereof meshing with the second corrugating roll, said stripper members extending partially around the periphery of said second corrugating roll toward the adhesive-applying roll but terminating before reaching the adhesive-applying roll, said adhesive-applying roll having circumferential grooves therein staggered with respect to those of the first corrugating roll, and a set of guide members penetrating into the grooves of the adhesive-applying roll, and staggered in position with respect to said first mentioned set of stripper members, said above mentioned set of guide members extending partially around the second corrugating roll, said above mentioned set of guide members being separate from the stripper members and free of the first corrugating roll.

2. A corrugating machine having a first corrugating roll, a second corrugating roll meshing therewith, an adhesive applying roll adjacent to the second corrugating roll in position to apply adhesive to the peaks of a corrugated web passing around with the second corrugating roll, said first mentioned corrugating roll having circumferential grooves therein, a stripper member support extending transversely across the machine substantially parallel to the above mentioned rolls, a set of stripper members carried by said support and penetrating into the above mentioned grooves of the first corrugating roll adjacent the portion thereof meshing with the second corrugating roll, said stripper members extending partially around the periphery of said second corrugating roll toward the adhesive-applying roll but terminating before reaching the adhesive-applying roll, said adhesive applying roll having circumferential grooves therein staggered with respect to those of the first corrugating roll, and a set of guide members penetrating into the grooves of the adhesive-applying roll, and staggered in position with respect to said first mentioned set of stripper members, said above mentioned set of guide members extending partially around the second corrugating roll to guide the corrugated web partially around said roll after the adhesive has been applied thereto by said adhesive applying roll, said above mentioned set of guide members being free of the first corrugating roll and being also carried by the stripper member support at points thereon between the first mentioned set of stripper members.

3. A corrugating machine having a first corrugating roll, a second corrugating roll meshing therewith, an adhesive-applying roll adjacent the second corrugating roll in position to apply adhesive to the peaks of a corrugated web passing around with the second corrugating roll, said first mentioned corrugating roll having circumferential grooves therein, a set of stripper members penetrating into the above mentioned grooves of the first corrugating roll adjacent the portion thereof intermeshing with the second corrugating roll, said stripper members extending partially around the periphery of said second corrugating roll toward the adhesive-applying roll but terminating before reaching the adhesive-applying roll, said adhesive-applying roll also having circumferential grooves therein and a set of guide members penetrating into said last mentioned grooves and extending partially around the second corrugating roll to guide the corrugated web partially around with the part of said roll which is near said adhesive-applying roll, said above mentioned set of guide members being free of

the first corrugating roll and the above mentioned stripper members.

4. A corrugating machine having a first corrugating roll, a second corrugating roll meshing therewith, an adhesive-applying roll adjacent the second corrugating roll in position to apply adhesive to the peaks of a corrugated web passing around with the second corrugating roll, said first mentioned corrugating roll having circumferential grooves therein, a stripper member support extending transversely across the machine substantially parallel to said rolls, a set of stripper members carried by said support and penetrating into the above mentioned grooves of the first corrugating roll adjacent the portion thereof intermeshing with the second corrugating roll, said stripper members extending partially around the periphery of said second corrugating roll toward the adhesive-applying roll but terminating before reaching the adhesive-applying roll, said adhesive-applying roll also having circumferential grooves therein and a set of guide members penetrating into said last mentioned grooves and extending partially around the second corrugating roll to guide the corrugated web partially around said roll after the adhesive has been applied thereto by said adhesive-applying roll, said above mentioned set of guide members being free of the first corrugating roll, said stripper member support being located above the adhesive-applying roll and said above mentioned set of guide members being also carried thereby and projecting downwardly through the grooves in the adhesive-applying roll to guide the web around the second corrugating roll as above mentioned.

5. A corrugating machine having an adhesive-applying roll positioned to apply adhesive to the peaks of a corrugated web passing through the machine, said adhesive-applying roll having circumferential grooves therein, guide members penetrating into said grooves to engage the web adjacent said adhesive-applying roll and members positioned to act on the corrugated web after it has passed said adhesive-applying roll, for applying adhesive to the areas of the peaks of the corrugated web which are in line with the above mentioned circumferential grooves of the adhesive-applying roll.

6. A corrugating machine having a first corrugating roll, a second corrugating roll meshing therewith, an adhesive-applying roll adjacent the second mentioned corrugating roll, said adhesive-applying roll having circumferential grooves therein, guide members penetrating into said grooves and extending partially around said second corrugating roll, to engage the web during and after the application of adhesive thereto, and members carried by the above mentioned extended portions of said guide members for transferring adhesive from the peaks of the corrugated web to the areas thereof which are in line with the above mentioned circumferential grooves of the adhesive-applying roll.

7. A corrugating machine having a first corrugating roll, a second corrugating roll meshing therewith, an adhesive-applying roll adjacent the second corrugating roll in position to apply adhesive to the peaks of a corrugated web passing along with the second corrugating roll, said adhesive applying roll having circumferential grooves therein, guide members penetrating into said grooves and extending partially around the second corrugating roll to guide the corrugated web after adhesive has been applied thereto, said guide members having walls adapted to conduct

adhesive from the peaks of the corrugations to areas thereof which are in line with the above mentioned circumferential grooves.

8. A corrugating machine having a corrugating roll, an adhesive applying roll located adjacent thereto in position to apply adhesive to a web passing between said rolls, said adhesive applying roll having a circumferential groove therein, and a member positioned to act on the corrugated web for applying adhesive to the area of the web which is in line with the above mentioned circumferential groove of the adhesive applying roll.

9. A corrugating machine having a corrugat-

ing roll, an adhesive applying roll located adjacent thereto in position to apply adhesive to a web passing between said rolls, said adhesive applying roll having a circumferential groove therein, and a member positioned to act on the corrugated web after adhesive has been applied thereto by said adhesive applying roll, said member being provided with means for transferring adhesive applied to the web by said adhesive applying roll, from areas of the web out of line with said circumferential groove to areas of the web which are in line with said groove.

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