

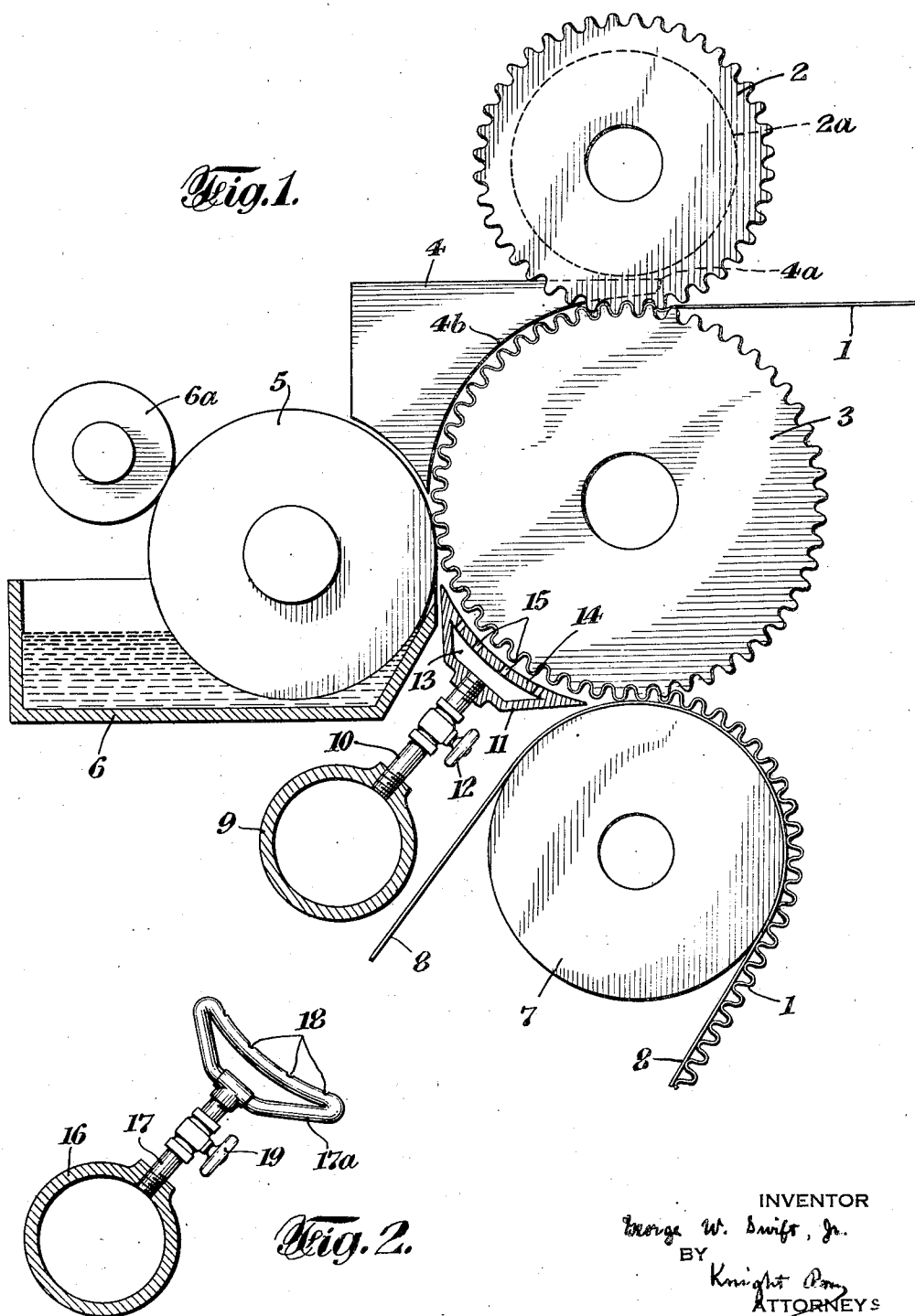
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MACHINE FOR MAKING CORRUGATED PAPER BOARD

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MACHINE FOR MAKING CORRUGATED
PAPER BOARD

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The present invention relates more especially to that type of corrugated paper board machine in which a continuous liner web is continuously applied to the silicated tips of a corrugated web as the latter is passed around one of the corrugating rolls which cooperate in the production of the corrugated web. It has been customary heretofore to construct the silicate or adhesive applying rolls in machines of this character with peripheral grooves arranged, say, from three to four inches apart along the axis of the silicate roll and to arrange fixed fingers, guides or strippers to extend through said grooves, said guide fingers or strippers being suitably shaped to conform to the periphery of the corrugated roll for retaining the corrugated web in mesh with the corrugated roll. Machines of this character have been subject to certain drawbacks due to the guide fingers becoming gummed-up by the silicate which furthermore runs down the guides and drops onto the paper below. Another drawback to a machine of this character resides in the fact that the arcuate edges of the guides in pressing against the tips of the corrugated web for holding the corrugations of the web in mesh with the corrugated roll, keep the silicate adhesive from being applied to peripheral series of bald tips arranged in circular streaks $\frac{3}{4}$ of an inch wide and three to four inches apart. As a result, there will be no bond between the corrugated and liner webs at these points and in the event that the creases formed in a blank during the manufacture of a box happen to be located near these bald streaks, the tendency is to produce boxes of inferior quality.

The primary purpose of my invention is to overcome the above drawbacks by an improved construction and arrangement of parts in a machine of this character whereby pressure may be applied to the corrugated web by means of a suitable fluid pressure medium such, for example, as compressed air (preferably in a heated condition), dry steam, or other heated fluid which, by being directed against the corrugated web as it moves around the corrugating roll, operates to hold the web in mesh therewith without the use of finger guides. In this way, the tips of the corrugated web may be left uncovered throughout the width of the web so that by applying continuous bands of adhesive to said tips from one side of the corrugated web to the other, there will be no loose points in the seal between the corrugated web and its liner. It will be understood furthermore that by using pressure fluids which are heated sufficiently to avoid

cooling off the web-corrugating rolls, the latter's function of impressing the corrugations in the web, may be carried on without lessening their effectiveness as irons which tend to set the web permanently in its corrugated form.

Further and more particular objects of my invention will appear in the specification, peculiar features in the construction and arrangement of certain parts being recited in the claims and shown on the accompanying drawing which illustrates an adaptation of my invention in a preferred embodiment.

In the drawing,

Figure 1 is a diagrammatic vertical longitudinal section of the main essential portions of a machine of this character showing an adaptation of my invention thereto.

Figure 2 is a modified detail shown partly in transverse section and partly in side elevation.

Referring more particularly to the drawing, my invention is shown in an adaptation to a corrugated paper board machine in which a web 1 is supplied in a horizontal plane in which an upper corrugating roll 2 cooperates with a lower corrugating roll 3. As said web passes between the corrugated rolls 2 and 3, it becomes corrugated and is passed around the periphery of the lower corrugated roll 3 with its corrugations maintained in mesh with the corrugations of said roll. For this purpose, as indicated in Figure 1 of the drawing, the upper corrugated roll 2 is provided with a plurality of axially spaced peripheral grooves having a common depth indicated by the broken line 2^a to accommodate the rearwardly presented stripper fingers 4^a which project into said grooves, said fingers forming integral portions of a series of laterally spaced plates 4 which are provided with arcuate edges 4^b conforming to the periphery of lower corrugated roll 3 for guiding the corrugated web downwardly while maintaining the corrugations of the web in close juxtaposition with the corrugations of the roll 3. An adhesive or silicate roll 5 is suitably arranged to bear peripherally against the crowns or tips of the corrugated web as they successively pass the common plane of the rotary axes of the lower corrugating roll 3 and adhesive applying roll 5. The adhesive roll 5 is arranged to rotate in an adhesive trough 6 and is provided with an unbroken peripheral surface for applying adhesive to the tips or crowns of the corrugated web without any bare spots from one edge to the other of the corrugated web. To avoid gumming-up the laterally spaced guide plates 4, said plates terminate above the common axial plane of the rolls 3 and 5 and

are spaced from the adhesive roll along their edges which lie contiguous to said adhesive roll. A squeegee roll 6^a operates peripherally on the roll 5 for preventing an excessive supply of adhesive reaching the corrugated web. In the form of corrugated paper board machine shown in Figure 1 of the drawing, the corrugated web 1 moves downwardly around the corrugated roll 3 until it reaches a vertical plane common to the rotary axes of said corrugated roll and a pressure roll 7 over which a liner web 8 is moving continuously, said pressure roll being arranged to press the liner web into engagement with the moist tips of the corrugated web after which the single faced corrugated board passes around the pressure roll 7 and to any desired point. In order to avoid the drawbacks discussed above in machines of this character as usually constructed, the present application contemplates the avoidance of the usual guides or plates which extend between the adhesive applying line and the liner applying line for slidably engaging the corrugated web and maintaining it in mesh with the corrugated roll. For this purpose, my present invention contemplates the application of pressure by means of a fluid pressure medium such as heated compressed air, dry steam or other heated fluids whereby it becomes possible to maintain the corrugated web in proper position on the corrugated roll without the use of slidably contacting guide plates which become gummed-up with adhesive and at the same time to overcome the necessity for peripherally grooving the silicone roll and to prevent the formation of bald streaks leading to the production of boxes, etc. of inferior quality. As an illustration of suitable means for carrying out this purpose, I have shown in Figure 1 of the drawing a pipe or conveyor 9 for compressed air or steam from which at spaced intervals throughout the length of the corrugated roll 3, pipes 10 lead off to one or more fluid pressure boxes 11. In each of the pipes 10, a hand valve 12 is arranged for regulating the pressure in the chamber or chambers 13 of the fluid pressure box or boxes. For the purpose of maintaining the corrugated web in position on the corrugated roll 3, the fluid pressure box 11 is constructed with an arcuate front wall 14 in close juxtaposition to, but spaced from, the corrugated web 1 and said arcuate wall is provided with suitably spaced outlets or openings 15 for maintaining a uniformly distributed pressure on the corrugated web for holding it in position during its movement from the adhesive roll to the liner applying pressure roll. As a modified form of the fluid pressure system I have shown in Figure 2 of the drawing a pressure main or conveyor 16 with radial pipes 17 leading therefrom to suitably bent pipes 17^a provided with discharge outlets 18, suitable hand valves 19 being provided for the proper pressure control.

I claim:—

1. In a corrugated paper board machine, the combination of a corrugated roll rotatable about an axis and constructed to mesh with a continuous corrugated web for conveying said web past an adhesive roll to a liner-applying roll, an adhesive roll arranged to apply adhesive to the outwardly presented tips of said corrugated web as said web is conveyed thereby around the rotary axis of said corrugated roll, a liner-applying roll cooperating with said corrugated roll at a peripherally spaced distance from said adhesive roll for applying a liner web to said corrugated web, said liner-applying roll being constructed and arranged to guide a continuous liner web into engagement with the

adhesive-bearing tips of the corrugated web and to convey the liner web with corrugated web attached thereto away from said corrugated roll, and a receiver for compressed air, having an arcuate wall conforming to and presented in close juxtaposition to the corrugated roll between said adhesive roll and said liner-applying roll, said arcuate wall being provided with compressed air discharge outlets.

2. In a corrugated paper board machine, the combination of a pair of cooperating paper-corrugating rolls, an adhesive roll cooperatively arranged with respect to one of said corrugating rolls for applying adhesive to the outwardly presented tips of a corrugated web as said web is conveyed by and moving with the last-mentioned corrugating roll, a liner-applying roll cooperating with said last-mentioned corrugating roll at a peripherally spaced distance from said adhesive roll for applying a liner web to said corrugated web, and a receiver for compressed air, said compressed air receiver being provided with discharge outlets presented inwardly in close juxtaposition to the last-mentioned corrugating roll between said adhesive roll and said liner-applying roll for retaining said corrugated web in mesh with said corrugated roll.

3. In a corrugated paper board machine, the combination of cooperating paper corrugating rolls which are constructed and arranged to form corrugations in a continuous web as it passes between said rolls, a smooth-surfaced roll cooperating with one of said corrugating rolls for applying a liner web to said corrugated web, an adhesive roll intermediately arranged with respect to the other of said corrugating rolls and said smooth-surfaced roll for applying adhesive to the outwardly presented tips of a corrugated web conveyed by and moving with said one of the corrugating rolls, and a compressed air receiver having an arcuate wall conforming to and spaced from the path of the adhesive-bearing tips of the corrugated web between said adhesive and smooth-surfaced rolls, said arcuate wall being provided with discharge outlets for projecting jets of compressed air against said corrugated web.

4. In a corrugated paper board machine, the combination with a pair of paper corrugating rolls which are constructed and arranged to form corrugations in a continuous web as it passes between said rolls, a liner-applying roll cooperating with one of the paper-corrugating rolls in the common axial plane of said corrugating rolls, an adhesive roll cooperating with said lower corrugating roll intermediately with respect to the other corrugating roll and said liner-applying roll, said adhesive roll being arranged to operate on the outwardly presented tips of said corrugated web while it moves in mesh with said lower corrugating roll, a compressed air main arranged parallel to the rotary axis of said lower corrugating roll and intermediately with respect to said adhesive and liner-applying rolls, and a wind box mounted on and connected to said compressed air main, said wind box having an arcuate wall conforming to and spaced from the tips of the corrugated web passing between said adhesive and liner-applying rolls, said arcuate wall of the wind box being provided with air outlets spaced axially and peripherally with respect to the lower corrugating roll.

5. In a corrugated paper board machine, the combination of two cooperating paper corrugating rolls, a pressure roll rotatably engaging one of the paper corrugating rolls at a distance pe-

ripherally from the other corrugating roll, a silicate roll arranged intermediately with respect to said other corrugating roll and said pressure roll for applying silicate to the crowns of the corrugated paper moving around said one of the paper corrugating rolls, and a series of axially spaced compressed air receivers interposed between said silicate and pressure rolls, each of said compressed air receivers being provided with an arcuate series of discharge outlets conformably arranged with respect to the last-mentioned paper corrugating roll.

6. In a corrugated paper board machine, the combination with a corrugated roll rotatable about an axis for conveying a continuous corrugated web which is enmeshed therewith to a position where said corrugated web is separated from the corrugated roll, and a receiver for fluid pressure medium extending exteriorly to and around a portion of the periphery of said corrugated roll with which the corrugated web is enmeshed, said receiver being constructed to project a current of fluid pressure medium against the corrugated web for retaining it in close relation to said corrugated roll as it approaches said position where the web is separated from the corrugated roll.

7. In a corrugated paper board machine, the combination with a corrugated roll rotatable about an axis for conveying a continuous corrugated web past an adhesive roll and into position to have a liner web applied thereto, an adhesive roll arranged to operate on the outwardly presented tips of said corrugated web as said web

is conveyed past said adhesive roll enmeshed with said corrugated roll, a pressure roll arranged to cooperate with said corrugated roll at said position, and a receiver for fluid pressure medium arranged exteriorly to said corrugated roll and intermediately with respect to said adhesive roll and said pressure roll, said receiver being constructed to project a current of fluid pressure medium against the corrugated web for retaining it in mesh with said corrugated roll while said corrugated web is moving over the space between said adhesive roll and said pressure roll.

8. In a corrugated paper board machine, the combination with a corrugated roll rotatable about an axis for conveying a continuous corrugated web past an adhesive roll and into position to have a liner web applied thereto, an adhesive roll arranged to operate on the outwardly presented tips of said corrugated web as said web is conveyed past said adhesive roll enmeshed with said corrugated roll, a pressure roll arranged to cooperate with said corrugated roll at said position, a receiver for fluid pressure medium arranged exteriorly to said corrugated roll, said receiver being provided with a discharge outlet wall extending approximately from said adhesive roll to said pressure roll around the periphery of said corrugated roll for projecting fluid pressure medium against the corrugated web for retaining it in mesh with said corrugated roll, and means for continuously supplying said receiver with fluid pressure medium.

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