

May 17, 1955

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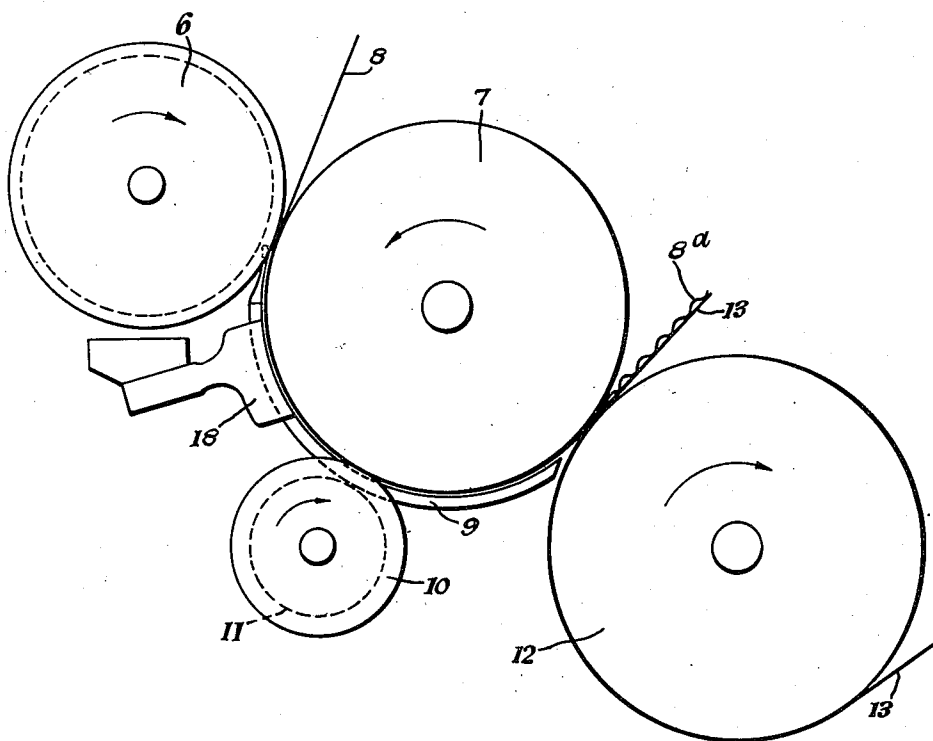
2,708,472

MACHINES FOR MAKING CORRUGATED PAPER BOARD

Filed June 17, 1952

4 Sheets-Sheet 1

Fig. 1.



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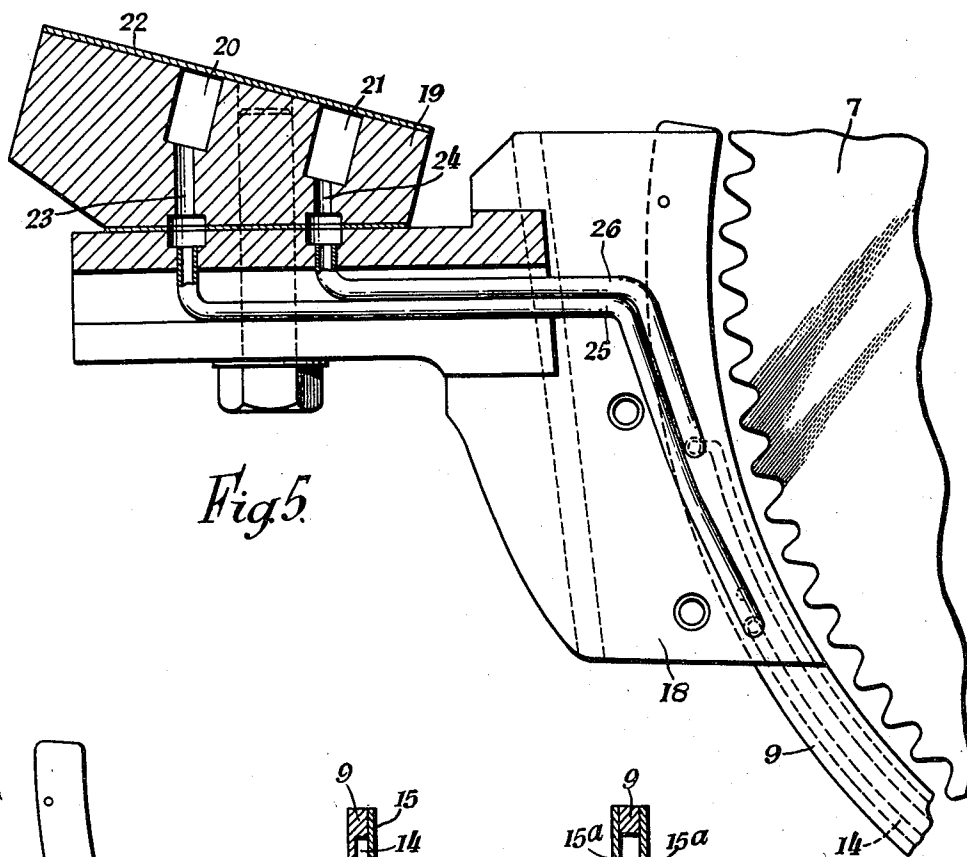


Fig. 5

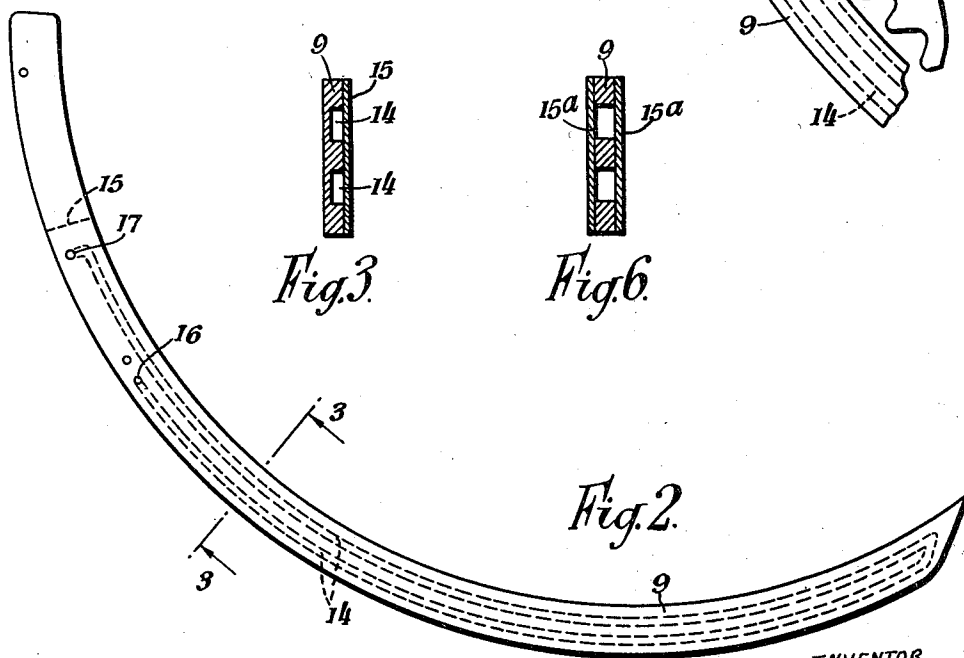


Fig. 3

Fig. 6

Fig. 2

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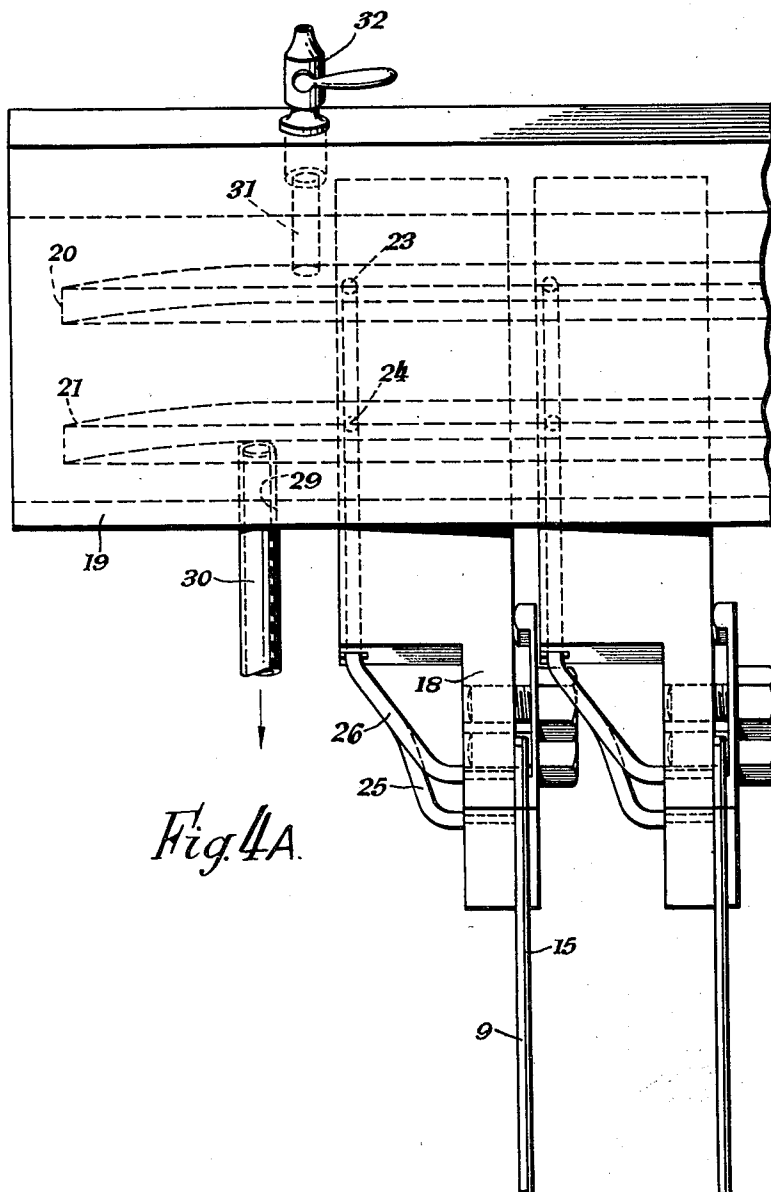


Fig. 4A.

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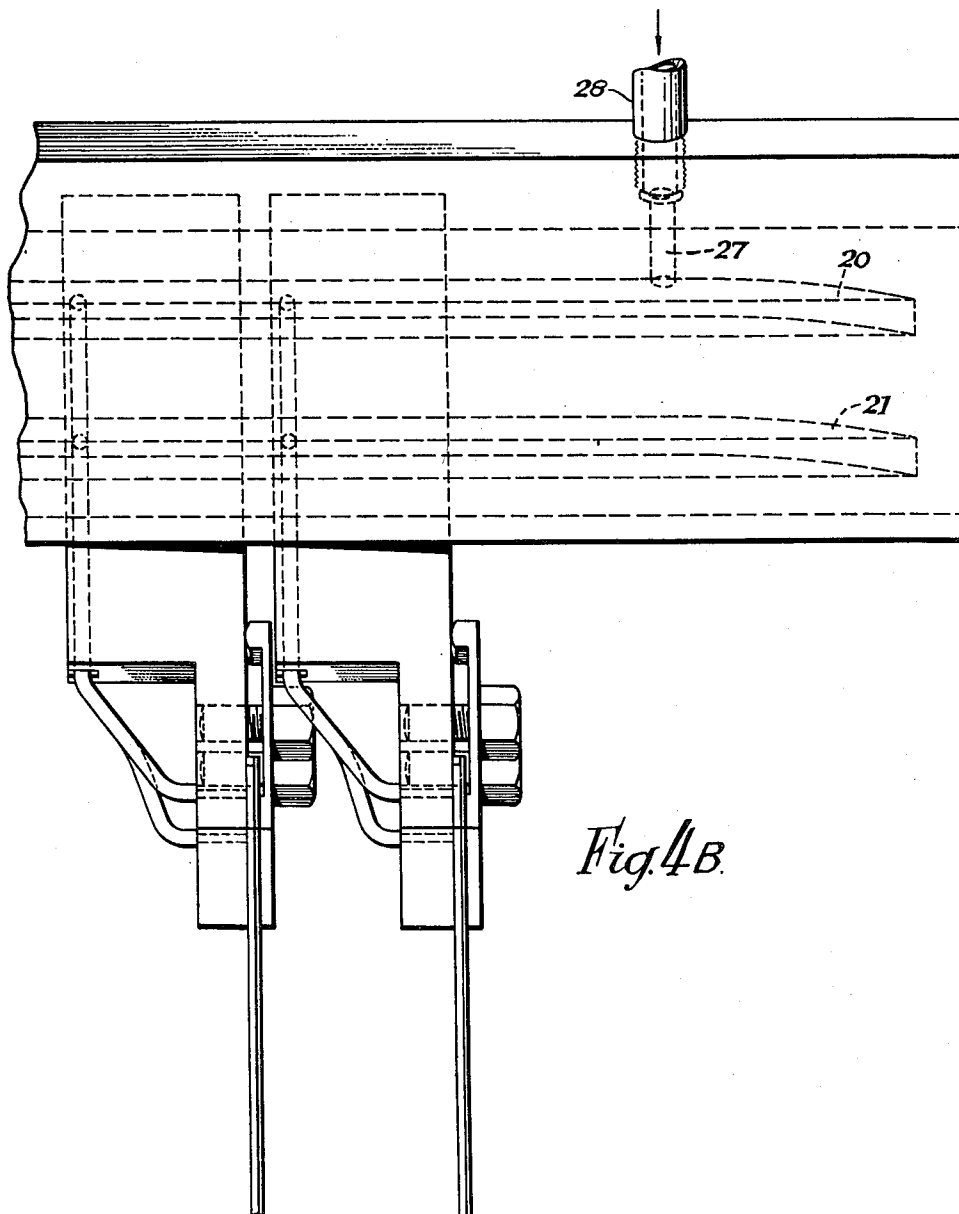


Fig. 4B.

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2,708,472

MACHINES FOR MAKING CORRUGATED PAPER BOARD

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Application June 17, 1952, Serial No. 294,028

Claims priority, application Great Britain March 24, 1952

4 Claims. (Cl. 154—31)

This invention concerns improvements in or relating to machines for making corrugated paper board.

In such machines a web of paper is passed between a pair of grooved corrugating rollers which co-operate to produce corrugations in the paper web. The corrugated web is then united with a further web or liner of uncorrugated paper. For this purpose the corrugated web often has adhesive applied to the tips of the corrugations while it is still retained on the grooved surface of one of the corrugating rollers, after which the liner is pressed against it. The adhesive is in such a case applied by a roller and the liner is led about a further roller so as to be applied to the corrugated web which has just received adhesive. The corrugating rollers are heated to assist in the corrugating of the paper, and the pressure roller which applies the liner is also heated.

In order to retain the corrugated web properly on the corrugating roller during these operations, guide members called strippers are employed. These consist of thin blade-like members of arcuate form which extend about the circumference of the corrugating roller nearly to the position at which the liner is applied. The adhesive-applying roller is provided with circumferential grooves to accommodate the strippers. It is often found in practice that those parts of the strippers which extend beyond the adhesive-applying roller, and which therefore act as guides for corrugated paper to which adhesive has been applied, tend to become coated with liquid adhesive (the most generally used at the present time being alkali silicate) which dries on the strippers and accumulates in a hard mass, which in a relatively short time builds up to such a size as to interfere with the satisfactory operation of the apparatus. In such a case the strippers have to be cleaned periodically.

It has now been discovered that if that portion of a stripper which tends to become coated with adhesive (that is to say, the portion which extends from the adhesive-applying roller towards the pressure roller) is continuously cooled while the machine is operated, the tendency for adhesive to collect and build up upon that portion of the stripper is considerably reduced, if not avoided entirely.

According to the present invention there is provided, in apparatus for making corrugated board in which a guide member (e. g. a stripper) is arranged to guide a corrugated web to which liquid adhesive (e. g. an alkali silicate such as sodium silicate) has been applied, means to cool a part at least of the guide member so as to maintain the temperature of the said part at a lower level than that of the atmosphere immediately around it.

The said means may comprise an enclosed conduit in contact with (e. g. formed in or upon) the guide member, through which a stream of cooling fluid (e. g. cold water) can be passed so as to cool the guide member. The said conduit may be formed by a groove formed in the guide member and a closure member fixed on said guide member to close the groove.

Further according to the present invention there is

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provided for use in apparatus for making corrugated board, a stripper provided with an enclosed conduit for a cooling fluid, the said conduit having an inlet and an outlet whereby fluid can be passed through the conduit to cool the stripper.

Apparatus according to the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows diagrammatically a part of a corrugating machine;

Figure 2 is a view of a stripper;

Figure 3 is an enlarged sectional view on the line 3—3 of Figure 2;

Figures 4a and 4b show a plan view showing a mounting for the strippers;

Figure 5 is a sectional side elevation of part of Figure 4, and

Figure 6 is a view similar to Figure 3 but showing a modified arrangement.

Like reference numerals refer to like parts throughout the specification and the drawings.

Referring to the drawings, a pair of corrugating rollers 6 and 7, Figure 1, are arranged to receive a paper web 8 between them and to produce corrugations in the web in the known manner. A number of arcuate guide members known as strippers 9 are provided to guide the corrugated web so as to hold it in the grooves of the lower corrugating roller 7, and an adhesive-applying roller 10 is located beneath the roller 7 to apply liquid adhesive to the tips of the corrugations in the web. The adhesive-applying roller 10 has circumferential grooves 11 to accommodate the strippers 9, which as shown in Figure 1 extend beyond the roller 10 and terminate just before the position at which a pressure roller 12 applies a liner 13 to the corrugated web 8a.

The portions of the strippers lying between the rollers 10 and 12 are the portions on which adhesive from the corrugated web tend to accumulate and build up.

Each of the strippers is provided with cooling means comprising a conduit formed in the stripper in the following manner. A groove 14 is formed along one side of the stripper as shown in Figures 2 and 3. The groove is covered by a thin metal plate 15, Figure 2, soldered or fixed in any other convenient way to the side of the stripper, and at the opposite ends of the groove holes 16 and 17 extend through the stripper to provide an inlet and an outlet port respectively to the conduit formed by the groove. As will be seen from Figure 2 the conduit extends along the stripper and back again so that both the inlet and the outlet ports are located at a part which as viewed in Figure 1 is to the left of the adhesive roller 10 and is thus easily accessible.

The strippers are mounted on brackets 18 fixed to a block 19 in which is formed a pair of parallel troughs 20 and 21, extending along the length of the block and closed at the top by a closure plate 22. A number of ducts 23 formed in the block communicate with the trough 20 and similar ducts 24 communicate with the trough 21, the ducts 23 and 24 being connected as shown to pipes 25 and 26 which communicate with the inlet ports 16 and outlet ports 17 respectively in the strippers. An inlet aperture 27 is formed in the block 19, communicating with the trough 20, and receives an inlet pipe 28. A similar aperture 29 extends from the lower surface of the block 19 to the trough 21 and receives an outlet pipe 30. The inlet pipe 28 is connected to a suitable water supply so that cold water under pressure can be forced through the pipe into the trough 20, from which it passes through the ducts 23 and pipes 25, and thence through the conduits 14 in the strippers, through the pipes 26 and the ducts 24, into the trough 21, from which it passes through the outlet pipe 30. In this way

a continuous supply of cold water can be passed through the strippers.

A further aperture 31, Figure 4A, is formed in the block 19 communicating with the trough 20, and is normally closed by a valve 32, which can be opened if desired to allow water to pass therethrough from the trough 20.

It is found that with this arrangement, when cold water is passed through the conduits so as to cool the strippers, there is little or no accumulation or building-up of adhesive on the strippers.

This is believed to be due to the fact that as both the corrugating roller 7 and the pressure roller 12 are heated, the air immediately surrounding the strippers 9 is also heated and contains a considerable quantity of water vapour released from the heated paper webs 8 and 13. Some of this vapour, it is believed, condenses on the cooled strippers, and the condensate so formed mixes with and dilutes any liquid adhesive which may be on the strippers, and the diluted adhesive is able to flow freely over the strippers and fall away from them. Thus the cooling of the strippers is thought to cause, in effect, a continuous washing of the strippers with water formed on them by the condensation of the water vapour in the heated air surrounding them.

If an attempt were made to obtain a similar effect by wetting the strippers in some other way, such for example as by playing a small jet of water on to the surfaces of the strippers so as to wash them and dilute the adhesive, there would probably be considerable risk of wetting the corrugated paper web on the corrugating roller, which is highly undesirable because wet paper tends to stick to the roller. It will be seen, however, that there is little or no risk of water formed by condensation on the strippers coming into contact with the paper, since the cooled parts of the strippers are beneath the paper and the tendency is for the condensate to run down the strippers.

In an alternative arrangement, a conduit is formed

in the stripper by forming a slot in the stripper instead of a groove, and closing the slot by means of thin plates 15a fixed on opposite sides of the stripper. This arrangement is illustrated in Figure 6. In this alternative arrangement the inlet and outlet apertures are, of course, formed in one of the closure plates.

What I claim as my invention and desire to secure by Letters Patent is:

1. In apparatus for making corrugated board, means to convey a corrugated web of material, means to apply adhesive to said corrugated web, a guide member to engage and guide a portion of said web to which adhesive has been applied, and means to cool at least a part of the said guide member so as to maintain the temperature of the said part at a lower level than that of the atmosphere immediately around it.

2. Apparatus as claimed in claim 1, in which said means comprises an enclosed conduit in contact with the said guide member, and means to pass a stream of cooling fluid through said conduit so as to cool the guide member.

3. Apparatus as claimed in claim 2, wherein the said conduit is formed by a groove formed in the guide member and a closure member fixed on said guide member to close the groove.

4. For use in apparatus for making corrugated board of the type comprising a corrugating roller and means to apply adhesive to a web of corrugated board carried on said roller, a stripper to engage and guide a portion of said web to which adhesive has been applied, said stripper having an enclosed conduit for a cooling fluid, said conduit having an inlet and an outlet whereby fluid can be passed through the conduit to cool the stripper.

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