July 13, 1948. J. WINTERBURN 2,445,254

MACHINE FOR THE MANUFACTURE OF WET PAPER BOARDS

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Fig.1.

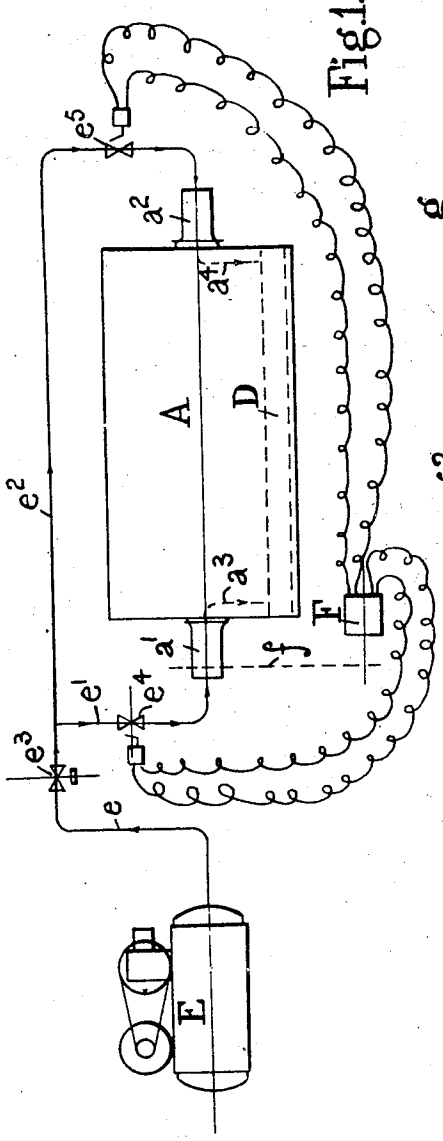
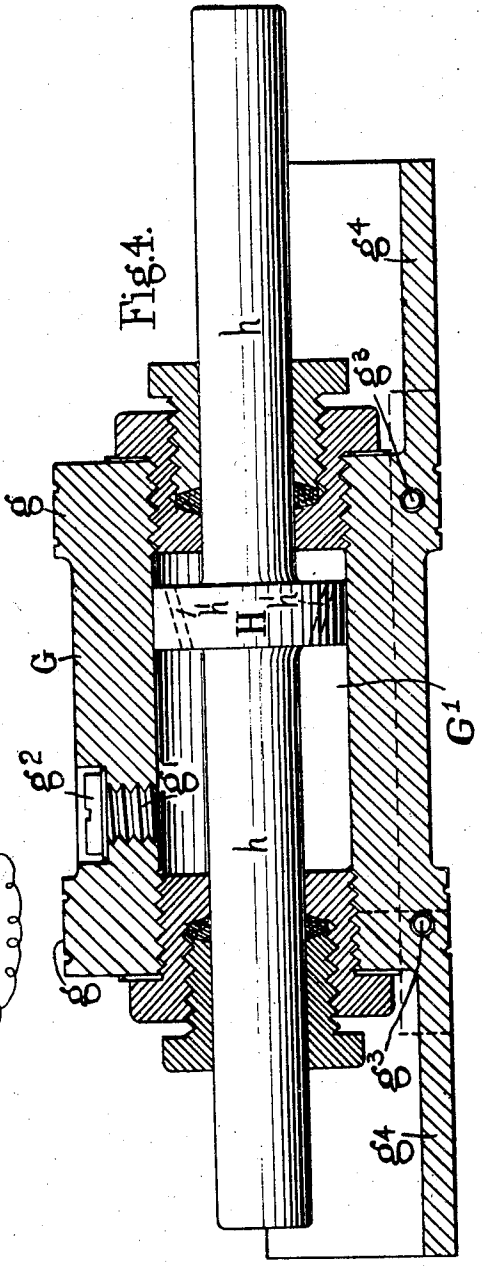


Fig.4.



INVENTOR

Joseph Winterburn

By Rossi & Bottemiller

ATTORNEYS

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Fig.2.

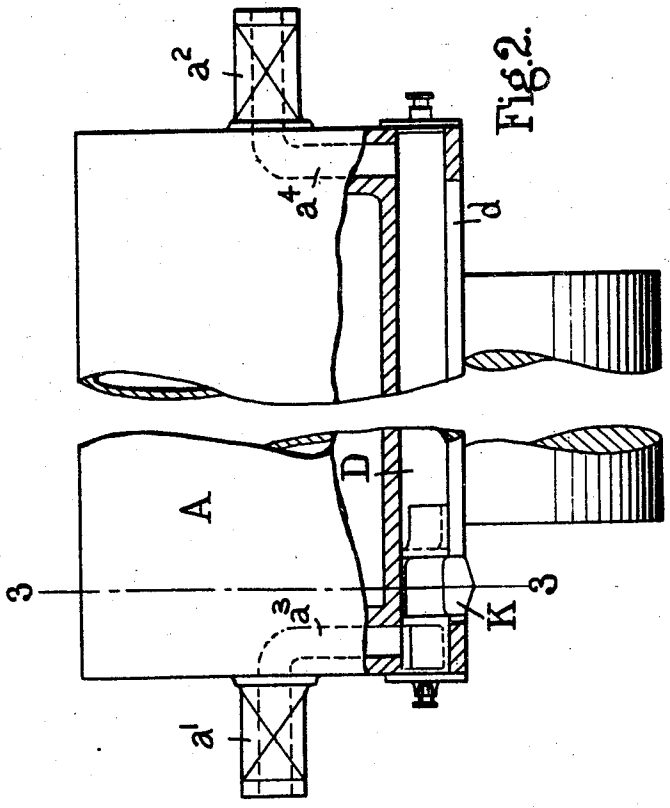
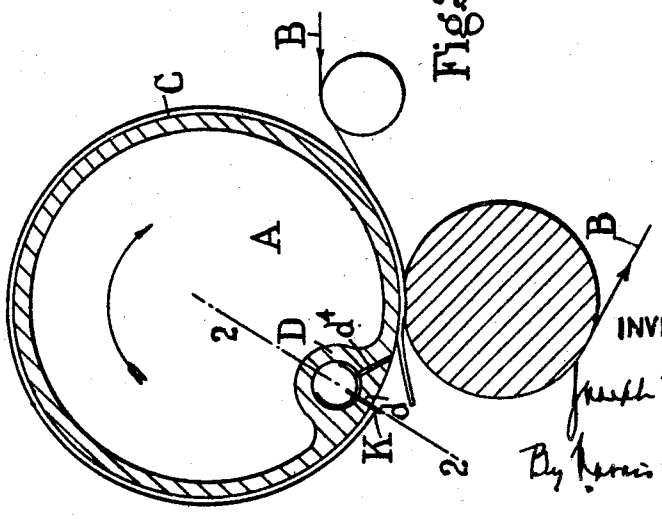


Fig.3.



INVENTOR

Joseph Winterburn

By Morris & Bateman

ATTORNEYS

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MACHINE FOR THE MANUFACTURE OF WET PAPERBOARD

Joseph Winterburn, Bury, England

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4 Claims. (Cl. 92—67)

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This invention relates to improvements in machines for the manufacture of wet paper board.

In such machines the wet paper is carried by a conveyor to a rotating cylinder on which it is wound the required number of turns to give the desired thickness of wet board and when this thickness is reached the laminated roll on the cylinders is severed longitudinally by the operative to form a sheet so that it can be removed. The severing of the roll is accomplished by the operative passing a knife or other severing tool along the roll, a longitudinal groove or slot being formed in the peripheral surface of the cylinder to guide the knife, the severing operation taking place whilst the cylinder is rotating and the paper being fed continuously thereto.

The object of the present invention is the provision of automatic means for severing the roll on the cylinder thus enabling the latter to be run at an increased speed thereby increasing the output from the machine. The provision of automatic means for severing the roll on the cylinder also reduces considerably the labour required for operating the machine.

According to the invention a longitudinal tube or barrel is arranged in the cylinder adjacent to the wall thereof, a longitudinal slot being formed in the wall between the bore of the tube or barrel and the periphery of the cylinder, and a device of substantially the same outer shape and dimensions as the bore of the tube or barrel is arranged therein and is adapted to be propelled from end to end of the tube by compressed air or gas when it is desired to sever the roll of paper on the cylinder, the said device carrying a knife projecting through the slot which engages and severs the roll of paper when the device is propelled from end to end of the cylinder.

The means for propelling the device from end to end of the tube or barrel is preferably brought into action automatically when the necessary number of turns of paper have been wound onto the cylinder to give the desired thickness of paper board.

In the following specification the device carrying the knife is referred to as the bullet.

The invention is illustrated in and will be described with reference to the accompanying drawings. In the drawings:

Fig. 1 is a diagrammatic view of a machine in which the bullet is traversed by compressed air, showing the connection for supplying compressed air to each end of the tube or barrel and the means for automatically controlling the supply.

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Fig. 2 is a front elevation, partly in section on line 2—2, Fig. 3, of the cylinder of the machine.

Fig. 3 is a transverse section on line 3—3, Fig. 2.

Fig. 4 is a section of the bullet drawn to a larger scale.

The rotating cylinder A to which the wet paper is conveyed by the conveyor B and onto which it is wound the desired number of turns to form the board C is formed with or has attached thereto a longitudinal tube or barrel D extending from end to end of the cylinder adjacent to the wall thereof. A slot d, preferably radial, is formed in the wall of the cylinder connecting the bore of the tube or barrel D with the exterior of the cylinder, the slot extending from a short distance of one end of the tube or barrel to within a short distance of the other end.

The trunnions a^1 and a^2, one at each end of the cylinder A, are hollow and are connected as shown diagrammatically in Fig. 1 with a compressed air accumulator E by the pipe line e which branches into the pipe lines e^1 and e^2. A reduction value e^3 is provided in the pipe line e if necessary.

A solenoid operated value e^4 is arranged in the pipe line e^1 and a solenoid operated valve e^5 in the pipe line e^2, the valves e^4 and e^5 being controlled by an electrical control box F driven by gears indicated by the dotted line f from the trunnion a^1 of the cylinder A. The passage in the trunnion a^1 is connected by the pipe or duct a^3 with one end of the tube or barrel D and the passage in the trunnion a^2 by the pipe or duct a^4 with the opposite end of the tube or barrel D.

The bullet which is propelled from end to end of the tube or barrel D by compressed air admitted through the pipes a^3 and a^4 comprises a cylinder G the ends g of which are of the same diameter as the bore of the tube or barrel. A piston H carried by a rod h which projects beyond each end of the cylinder G operates in a chamber G^1 filled with oil in the cylinder G, passages h^1 being formed in the piston to allow of the flow of oil from one side thereof to the other. The chamber G^1 is filled with oil through the aperture g^1 closed by the screw g^2. The portions g^4 of the ends g of the cylinder G which cover the slot d are extended as shown in Fig. 4.

A longitudinal slot or recess is formed in the cylinder G to receive the severing knife K which is secured in position by bolts passing through the holes g^3. The knife K projects from the cylinder G through the slot d as shown in Fig. 3.

The electrical control box F operates one or the other of the valves e^4 or e^5 after the desired

number of laps of paper have been wound on to the cylinder A, according to the end of the tube or barrel D at which the bullet G is situated, to supply compressed air behind the bullet and impel it to the opposite end of the tube or barrel, the knife K during the travel of the bullet severing the laps of paper wound onto the cylinder. When the next desired number of laps of paper have been wound onto the cylinder A the control box F operates the other valve of the valves e^4 and e^5 to supply compressed air to the opposite end of the tube or barrel D to return the bullet, the knife K again severing the roll on the cylinder A.

To assist in removing the severed sheet C from the cylinder A, the barrel or tube D is provided with a series of apertures d^4 behind the slot d in the direction of rotation of the cylinder A through which apertures a portion of the compressed air admitted thereto from behind the bullet G as the latter advances in the tube will escape and be directed onto the roll near the severed edge, causing the edge of the sheet to be detached from the cylinder and delivered onto a travelling conveyor by which it is removed for subsequent treatment.

The arrangement of the piston H in the oil filled chamber G^1 of the bullet G serves as a cushioning device when the bullet reaches either end of the tube or barrel D since the piston rod h will first come into contact with the end of the tube or barrel and the further movement of the bullet over the piston will force oil through the passages h^1 in the piston. If necessary pneumatic, electro-magnetic or other cushioning devices may also be provided at each end of the tube or barrel.

I claim:

1. In a machine for the manufacture of wet paper board, the combination with the cylinder onto which the paper is wound into a roll, of a tube situated within the cylinder and extending longitudinally from end to end thereof and having a longitudinal slot between its bore and the outer surface of the cylinder, means for admitting compressed gas to each end of the tube, a body fitted to reciprocate in the tube to be impelled from end to end thereof by compressed gas admitted to one or the other end of the tube according to the position of said body therein, a knife carried by said body to reciprocate therewith and projecting through said slot and movable longitudinally thereof to thereby sever the roll of paper on the cylinder during the traverse of said body from one end to the other end of the tube, and means located behind the longitudinal slot through which the knife projects and controlled by the movement of said body longitudinally in the tube for directing some of the compressed gas in the tube onto the roll of paper near its severed edge for detaching it from the cylinder.

2. In a machine for the manufacture of wet paper board, the combination with the cylinder onto which the paper is wound into a roll, of a tube situated within the cylinder and extending longitudinally from end to end thereof and having a longitudinal slot between its bore and the outer surface of the cylinder, means for admitting compressed gas to each end of the tube, a body freely movable longitudinally in the tube and adapted to be impelled from end to end thereof by compressed gas admitted to either

end of the tube according to the position of said body therein, cushioning means carried by said body and operative at each end of the travel of said body, a knife carried by said body and projecting through said slot and movable longitudinally in said slot to sever the roll of paper on the cylinder during the traverse of said body from one end to the other end of the tube, and means located behind said longitudinal slot through which the knife projects and controlled by the movement of said body longitudinally of the tube for directing some of the compressed gas in the tube onto the roll of paper near its severed edge for detaching it from the cylinder.

3. In a machine for the manufacture of wet paper board, the combination with the cylinder onto which the paper is wound into a roll, of a tube situated within the cylinder and extending axially from end to end thereof and having a longitudinal slot between its bore and the outer surface of the cylinder, means for admitting compressed gas to each end of the tube, a body movable longitudinally in the tube by compressed gas admitted to one or the other end thereof according to the position of said body therein, an oil filled chamber in said body, a piston movable within said chamber and having transverse passages through which the oil may pass from one to the other side thereof, a piston rod carrying the piston and projecting beyond each end of said body for engagement with one or the other end of the tube, and a knife carried by said body and projecting through said slot and movable longitudinally in said slot to sever the roll of paper on the cylinder during the traverse of said body from one end to the other end of the tube.

4. In a machine for the manufacture of wet paper board, the combination with the cylinder onto which the paper is wound into a roll, of a tube within the cylinder and extending axially thereof and having a longitudinal slot between its bore and the outer surface of the cylinder, means for admitting compressed gas to at least one end of the tube, a device reciprocable within the tube to be impelled longitudinally thereof by compressed gas admitted to said end thereof, a knife carried by said device and projecting through said slot, said knife being movable longitudinally of the cylinder to thereby progressively sever the roll of paper on the cylinder during the traverse of said device longitudinally of the tube, a series of apertures being provided in the cylinder behind said longitudinal slot and extending from the tube to the exterior of the cylinder, and means on said device for successively uncovering the apertures of said series to admit some of the compressed gas from behind said device to the roll of paper near its severed edge for detaching it from the cylinder.

JOSEPH WINTERBURN.

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