

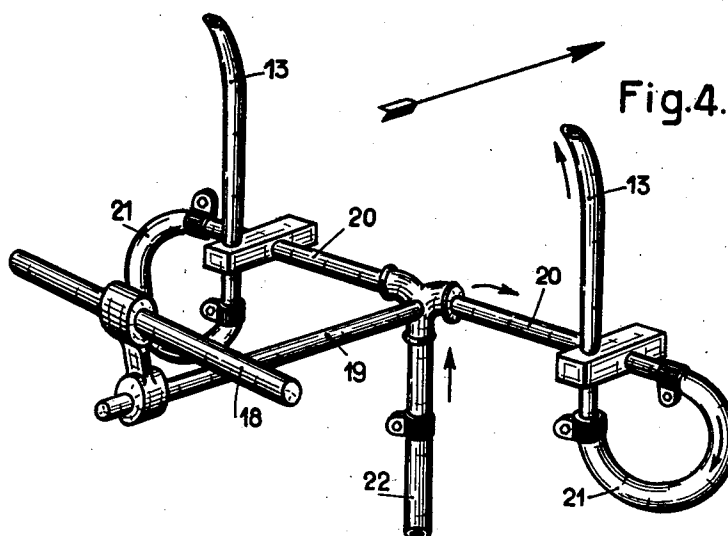
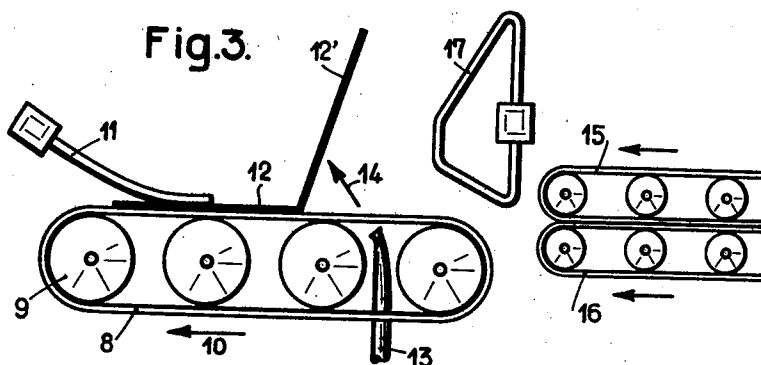
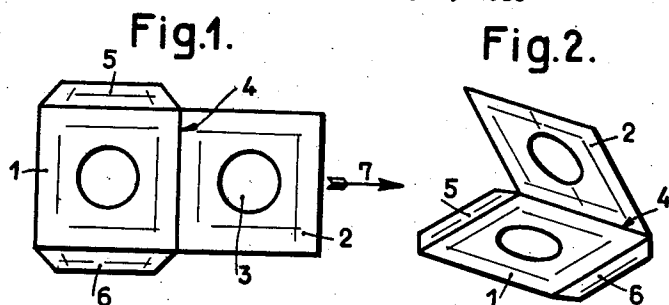
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FOLDING AND GLUING MACHINES OPERATING ON SHEETS

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FOLDING AND GLUING MACHINES OPERATING ON SHEETS

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1 Claim. (Cl. 270-69)

This invention relates to an apparatus for folding paper or cardboard to produce envelopes.

In folding and gluing machines, pre-cut pieces of paper or cardboard provided with scored or perforated lines on the places to be folded are conveyed between two belts and, by causing certain parts of the paper or cardboard to deviate from the initial plane of their trajectory or movement, one compels them to bend. After bending, to form a unit those parts which are coated with glue, are united to constitute a box or any wrapping.

As a rule, the machines of this type fold the paper or cardboard according to and along lines extending in the conveying direction by folding back the parts to be folded transversely to that direction.

It is an object of the invention to provide for improved folding techniques and the invention is to this end and at least partially, characterized by the use of blowing or air-jet mechanisms.

The objects, advantages and nature of the invention will be more fully understood from the following description of the preferred embodiment of the invention, shown by way of example in the accompanying drawing, in which:

FIG. 1 is a plan view of an envelope blank in unfolded condition which may be processed by this invention.

FIG. 2 is a perspective view of the envelope blank of FIG. 1 shown in a partially folded condition.

FIG. 3 is a somewhat diagrammatic side elevational view of part of an apparatus illustrating the invention more or less schematically, and

FIG. 4 is a perspective view of the blowing device or air jet mechanism more or less schematically.

Referring now more particularly to FIGS. 1 and 2 of the drawing, the pre-cut blank comprises two square parts 1 and 2, each having a central hole 3, and which are united by a folding line 4, part 1 being provided, laterally, with gluing flaps 5 and 6.

This pre-cut blank, which the conveying belts of the folding and gluing machine will seize and lead by the gluing flaps, goes through the machine in the direction of the arrow 7.

As to the gluing flaps, their folding back corresponds to a usual folding, but firstly, the part 2 must be folded backward towards part 1 around the line 4, as shown in FIG. 2.

To raise and fold back the part 2, a guide should be normally arranged across the path followed in the machine, the guide being removable to avoid opposing the conveyance of the blank. However, since the pieces to be folded and glued are moved through the machine at an extremely swift rate, such a disposition is practically impossible.

The folding and gluing machine, according to the invention resolves this problem by providing an air jet and a fixed guide between the guiding members which lead the pieces to be folded and glued by their edges. An air current practically perpendicular to the conveying plane operates as an air jet and is followed at least by the fixed guide which is mounted above this plane, so that any ele-

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ment of the operated blank raised by the air pressure of the air jet is afterwards folded back in a direction opposite to the direction of transport by any of the aforementioned fixed guides.

Referring now more particularly to FIGS. 3 and 4 of the accompanying drawing which show an embodiment of the invention, given by way of example, the conveying device and the blowing device are schematically shown.

In the view of FIG. 3, the conveying device comprises conveying straps 8, driven by cylinders 9 in the direction of the arrow 10. On these belts rest elastic member 11, ensuring the holding and conveyance of the blanks 12 inserted between conveying belts 8 and member 11. The blanks are also moved laterally and, as usual, by conveyor belts not shown which are shifted at the same speed as that of the belts 8.

Between these conveying belts 8 are placed nozzles 13 adapted for sending air blasts 14 outwardly across the conveying plane of blanks 12, practically perpendicular to this plane, but preferably with a slight backward inclination in relation to the travel direction.

FIG. 3 shows what kind of action the air pressure or jet exerts on the conveyed blanks. Part 12' of blanks 12 corresponding to part 2 of the FIGS. 1 and 2, when passing above the nozzles 13, is raised as shown.

Immediately after belts 8, are arranged other conveying belts 15 and 16, leading the blanks 12 to the conventional folding and gluing devices. But in front of these belts and after nozzles 13 are the fixed guiding member 17, placed above the conveying plane and whose purpose is to fold back completely, during their passage, the parts 12' raised by air blast from nozzle 13.

Thus, in proceeding on its way, the blank 12 will be folded back on itself, the part 12' being pressed on part 12. The remaining steps are to fold back and attach the gluing flaps, which will be performed in the conventional manner, since these flaps and their folding lines are turned towards the conveying direction.

As to the elements of the piping for conducting the air under pressure to the nozzles 13, FIG. 4, shows how these can be arranged, so as to be in an adjustable position to be adapted to the sizes and sections of the pieces to be folded.

Fixed on a cross-bar 18 of the folding and gluing machine is a longitudinal bar 19, bearing air conduits 20, directed transversely and serving as supports for the nozzles 13, which are directed upwards. Flexible joints 21 make it possible to shift the nozzles sidewise and to tilt them at will, a compressed air source (not shown) being applied to conduits 20 via feed conduit 22.

It is clear that all the elements represented, the position of which can be adjusted, will be provided with set-screws (not shown) and that the number of nozzles may differ from two. The piping may also comprise valves, thus controlling the flow of air therein.

What I claim is:

Apparatus for folding a rigid sheet comprising a pair of parallel coplanar belts spaced from one another and adapted to be driven together in a given direction, said sheet having a width which is greater than the spacing of the belts so that said sheet can be supported by said belts and advanced thereby, said sheet being provided with a fold line extending transverse to the direction of drive of the belts to divide the sheet into two portions which are connected for pivotal movement at said fold line, air blower means for directing a jet flow between said belts, said jet flow being of sufficient strength to cause pivotal movement of one of the rigid portions of the sheet about the fold line, resilient means adjacent said belts and located in front of the air blower means relative to the direc-

tion of drive of the belts for slidingly holding the other of the portions against said belts adjacent said air blower means, and a fixed guide adjacent said belts and located after the air blower means relative to the direction of drive of the belts for engaging said one portion with the latter pivotally displaced to fold said one portion into face to face relation with the other portion, said air blower means being located between the belts to direct said jet flow upwardly against said one portion, said jet flow being inclined backwardly relative to the direction of movement of the sheet.

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