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METHOD AND APPARATUS FOR DEPOSITING SHEETS EJECTED BY A CROSS CUTTER

Filed June 6, 1963

Fig. 1

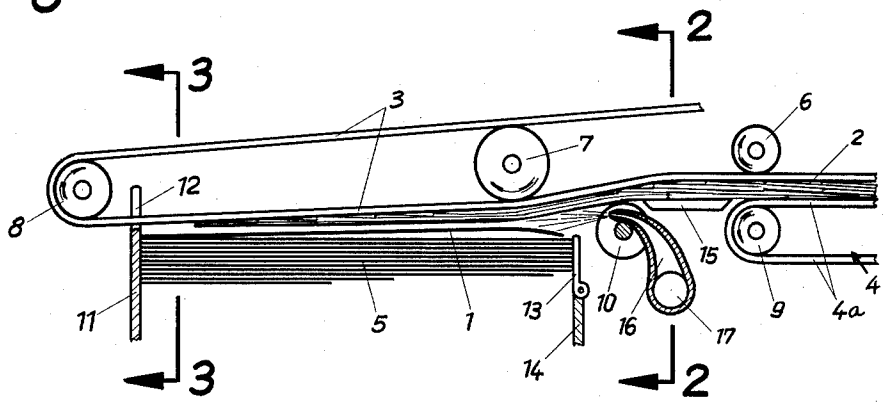


Fig. 2

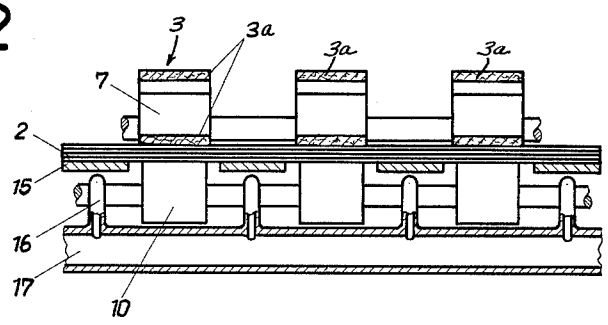
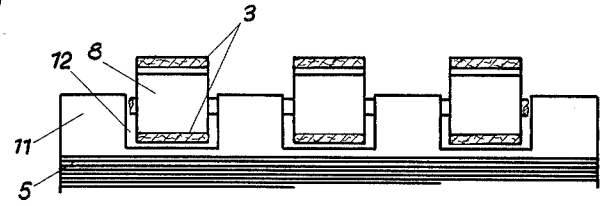


Fig. 3



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METHOD AND APPARATUS FOR DEPOSITING SHEETS EJECTED BY A CROSS CUTTER

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3 Claims. (Cl. 271—68)

The invention relates to a method of and apparatus for depositing overlapping sheets emanating from a cross cutter or other paper processing machine.

The difficulties and problems in connection with the deposition of sheets ejected by a cross cutter onto a stack reside in the necessity of bringing the sheets, which are delivered at a high speed, into a position of rest by means of a more or less strong retardation and deposit the sheets in an orderly manner with the formation of a straight-edged stack.

It is known to obtain an overlapping by a step-wise braking of the sheets, thereby creating the requisite conditions for a trouble-free deposition of the sheets, and in which connection the properties and particularly the firmness of the sheet material constitute a factor of substantial influence. However, as a matter of experience, sheets delivered singly can be deposited much more easily for forming a straight-edged stack than sheets which reach the zone or area of the receiving stack in the form of an overlapping sheet run or path. These known difficulties in the case of overlapping deposit assemblies, which are moreover increased because of the maximum speeds desired, show up primarily when there is a high degree of overlapping. There are further difficulties in connection with the slow starting of the machine and the subsequent speed-up phase which can be avoided only by manual intervention.

To overcome the above-mentioned difficulties, applicant proposes depositing the overlapping sheets ejected by the cross cutter in such a manner that by means of a compressed air cushion, effective in the zone of the stack, the foremost or leading of the overlapping sheets is separated from the trailing sheets and is deposited on the stack and simultaneously, under the influence of this compressed air cushion, the sheets still moving forward are held in the effective area of a conveyor means disposed above the stack.

Such a method provides for the trouble-free deposition of the sheets arriving via an overlapping sheet run or path and the stacking of the sheets in a smooth, straight-edged arrangement, with the compressed air cushion in conjunction with the conveyor means above the stack effecting advantageously a rapid and trouble-free separation of the leading sheet from the remainder of the sheet run as well as the rapid deposition of the separated sheet onto the stack. Simultaneously, under the influence of the compressed air cushion, the sheet run still moving forwardly is pressed against the conveyor means above the stack, whereby the sheet run, and thus the individual sheets, is brought positively into the correct position for deposition.

To initiate and speed up the separation of the leading and at the same time the lowest sheet from the sheet run, special measures are taken so that in the front area of the stack, the conveying means per se and therewith the sheet run lying against the conveyor means, is given a slight offsetting or deflection. This offsetting facilitates the lifting of the rearward end of the leading sheet during its forward movement so that compressed air can enter into the space or gap formed thereby and can become effective.

The present apparatus includes essentially a stack holder, known per se, having a rear, stationary boundary wall, lateral boundary walls and a front boundary wall preferably including a shaking member for straightening the stack. A blower acting in the direction of movement of the sheets is located directly ahead of the stack holder and a conveying means above the stack holder extends the entire length of the stack holder. The conveying means consists of several endless belts guided over rollers with the rollers directly ahead of, and those directly behind the front edge of the stack being offset relative to each other in such a fashion that the conveyor belts receive a slight offset in the front zone of the stack. To allow the conveyor belts to extend over the entire longitudinal extent of the stack holder, the rear wall of the stack holder is provided with cut-out areas through which the individual belts of the conveying means pass.

Further objects and advantages of the invention will become more readily apparent from the following detailed description and annexed drawings, and in which drawings:

FIGURE 1 is a view in side elevation, partly in cross section and partly broken away, illustrating an apparatus embodying the invention,

FIGURE 2 is a sectional view taken along the line 2—2 of FIGURE 1, the view looking in the direction of the arrows, and

FIGURE 3 is a sectional view taken along the line 3—3 of FIGURE 1, the view looking in the direction of the arrows.

Referring to FIGURE 1, a sheet run **2** delivered from a cross cutter (not shown), with such run being composed of individual overlapping sheets **1**, is guided between continuously rotating upper and lower conveyor means **3** and **4**, respectively, and is moved into the zone or area of a stack holder generally indicated **5**. The conveyor means consist of a plurality of spaced-apart belts **3***a*, **4***a* each having upper and lower flights and rollers **6**, **7**, **8**, **9** and **10** serve to guide the upper and lower conveyor belts. The stack holder **5** includes a rear, stationary boundary wall **11** and, as clearly illustrated in FIGURE 3, the wall **11** is provided with a plurality of cut-out areas or notches **12** through which the plurality of belts **3***a* are adapted to pass. Side walls (not shown) bound the longitudinal sides of the holder **5** and front wall **14** is provided at its upper area with a shaking or agitating member **13**.

A conveyor table **15** is located between the roller **9** of the lower conveyor means **4** and the roller **10**. The roller **10** is so located relative to the roller **7** that there is produced an offsetting or deflection of the upper conveyor belts **3***a* and, as a consequence, the sheet run **2** in the front zone or area of the stack holder **5**. In addition, a plurality of blast nozzles **16** which are supplied with compressed air from a common air conduit **17** which extends transversely of the apparatus, are located directly in front of and above the front wall of the stack holder **5**, as shown in FIGURE 1.

While the operation of the invention is believed readily apparent from the above description, it may be summarized as follows:

After the front edge of the leading sheet **1** of the run **2** has reached the rear wall **11**, the rear edge is located in the zone of the offsetting or deflection of the upper conveyor belts **3***a* determined by the roller **7**, which causes such end of the leading sheet to lift somewhat away from the underside of the run **2** and thus provide a gap or space. By virtue of the influence of the compressed air leaving the nozzles **16** and introduced into such space or gap, a compressed air cushion is built up between the leading sheet **1** and the sheet run **2**. The compressed air cushion effects an accelerated depositing of the sheet **1** which is now separated from the run **2**, and the air cushion simultaneously causes a holding of the still forwardly

moving run **2** against the upper conveyor belts **3***a* until the forward movement of the now leading sheet **1** is stopped by the rear wall **11** when such sheet will be separated from the run and deposited into the holder **5**.

The invention is not to be confined to any strict conformity to the showings in the drawings but changes or modifications may be made therein so long as such changes or modifications mark no material departure from the spirit and scope of the apppended claims.

What is claimed is:

1. An apparatus for depositing overlapping sheets emanating from a cross cutter and other paper processing machines, comprising a stack holder, upper and lower conveyors for moving the overlapping sheets to said stack holder, said upper conveyor extending above the entire longitudinal length of said stack holder and including a plurality of endless belts having upper and lower flights and axially spaced guide rollers for said belts, one of said guide rollers being located above the stack holder and having its periphery so located with respect to the periphery of another of said guide rollers in advance of the stack holder so as to deflect the lower flights of the belts downwardly adjacent the front of the stack holder to produce a gap between the rear edge of a leading sheet and a trailing sheet, and at least one fluid nozzle located in front of the stack holder below the lower flights of the belts for directing fluid into the gap to separate the sheets and deposit the leading sheet into the holder while holding the sheets still moving forward against the lower flights of the endless belts above the stack holder.

2. An apparatus for depositing overlapping sheets emanating from a cross cutter and other paper processing machines, comprising a stack holder, upper and lower conveyors for moving the overlapping sheets to said stack holder, said lower conveyor terminating in advance of the front of the stack holder, a table located between the lower conveyor and the front of the stack holder, said upper conveyor extending above the entire longitudinal length of said stack holder and including a plurality of endless belts having upper and lower flights and axially spaced guide rollers for said belts, one of said guide rollers being located above the stack holder adjacent the front of said holder, the periphery of said one guide roller being so disposed with the periphery of another of said guide rollers forwardly of the stack holder as to offset the lower flights of said belts downwardly adjacent the front of the stack holder to produce a gap between the rear edge of a leading sheet and a trailing sheet, a compressed air conduit extending transversely relative to the upper conveyor in front of the stack holder, and a plurality of nozzles carried by said air conduit for directing air into the gap to separate the sheets and deposit the leading sheet into the holder while holding the sheets still moving forward against the lower flights of the endless belts above the stack holder.

3. The apparatus as claimed in claim **2** in which said stack holder includes a rear wall having a plurality of cut-out areas through which the lower flights of said endless belts are adapted to pass.

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