May 9, 1961 C. R. PATTERSON 2,982,979

AUTOMATIC PASTING MACHINE FOR PAPER SHEETS OR THE LIKE

Filed May 11, 1959 5 Sheets-Sheet 1

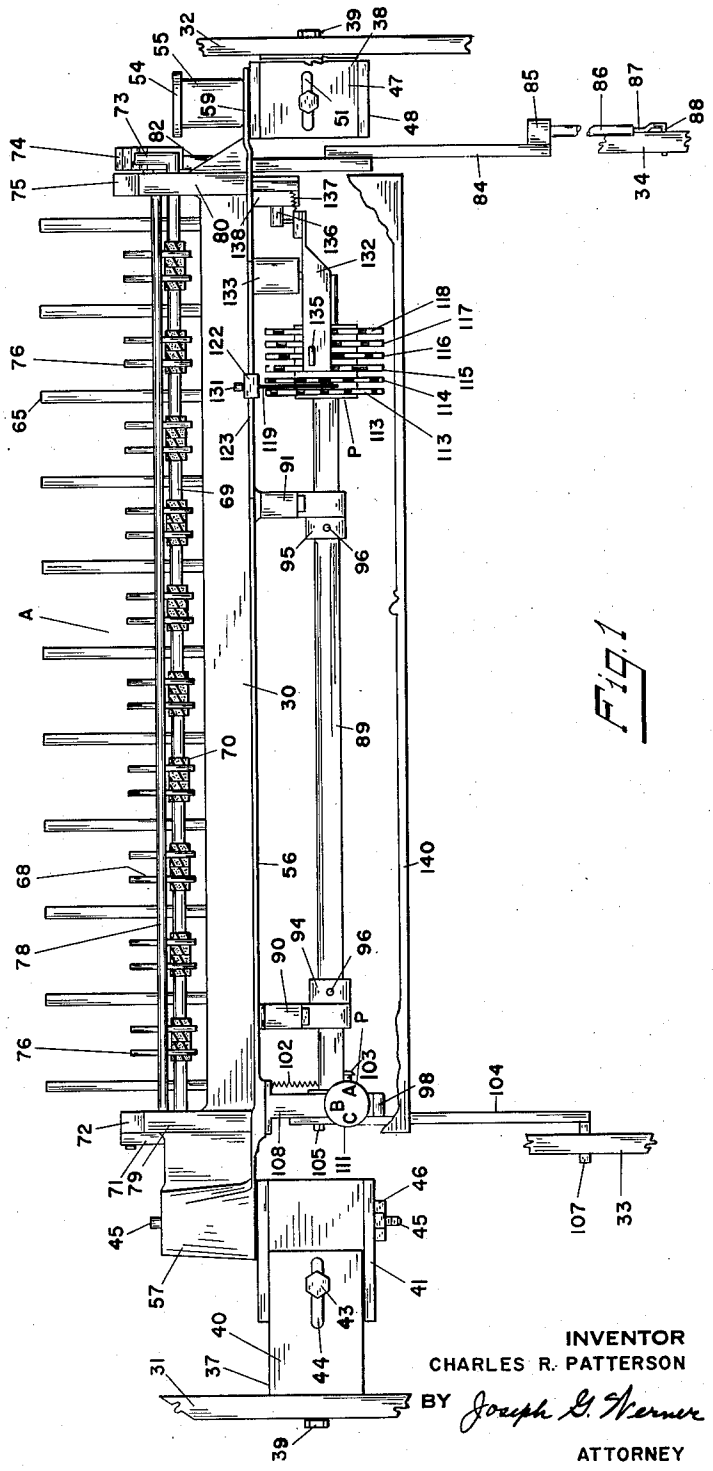

Fig. 1

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AUTOMATIC PASTING MACHINE FOR PAPER SHEETS OR THE LIKE

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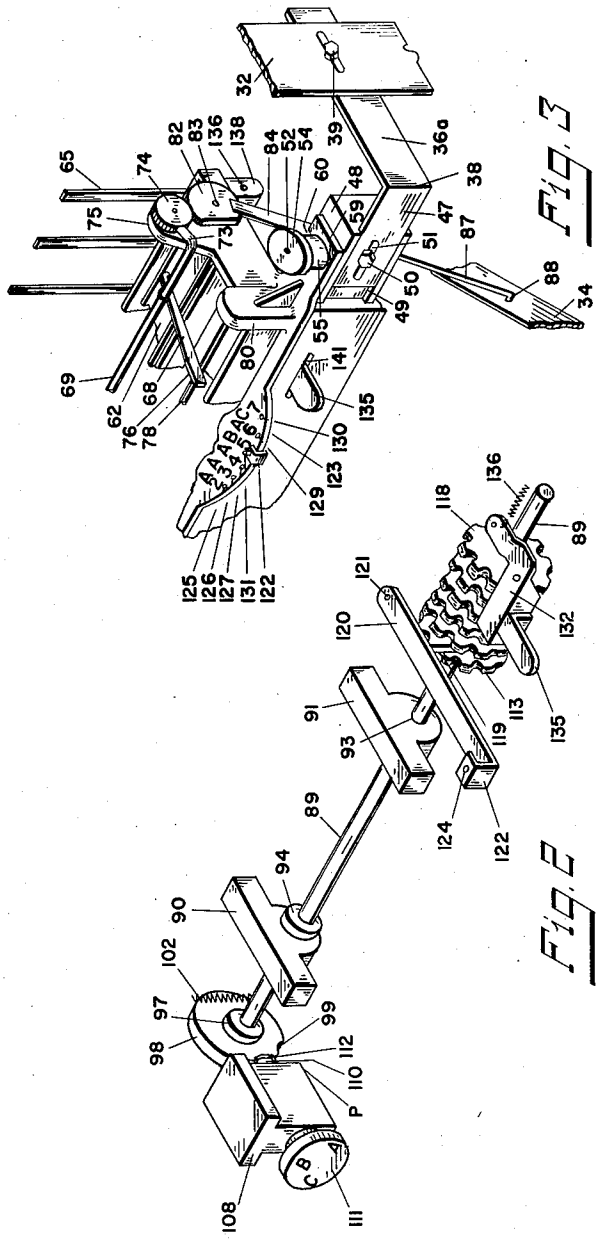

FIG. 3

FIG. 2

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AUTOMATIC PASTING MACHINE FOR PAPER SHEETS OR THE LIKE

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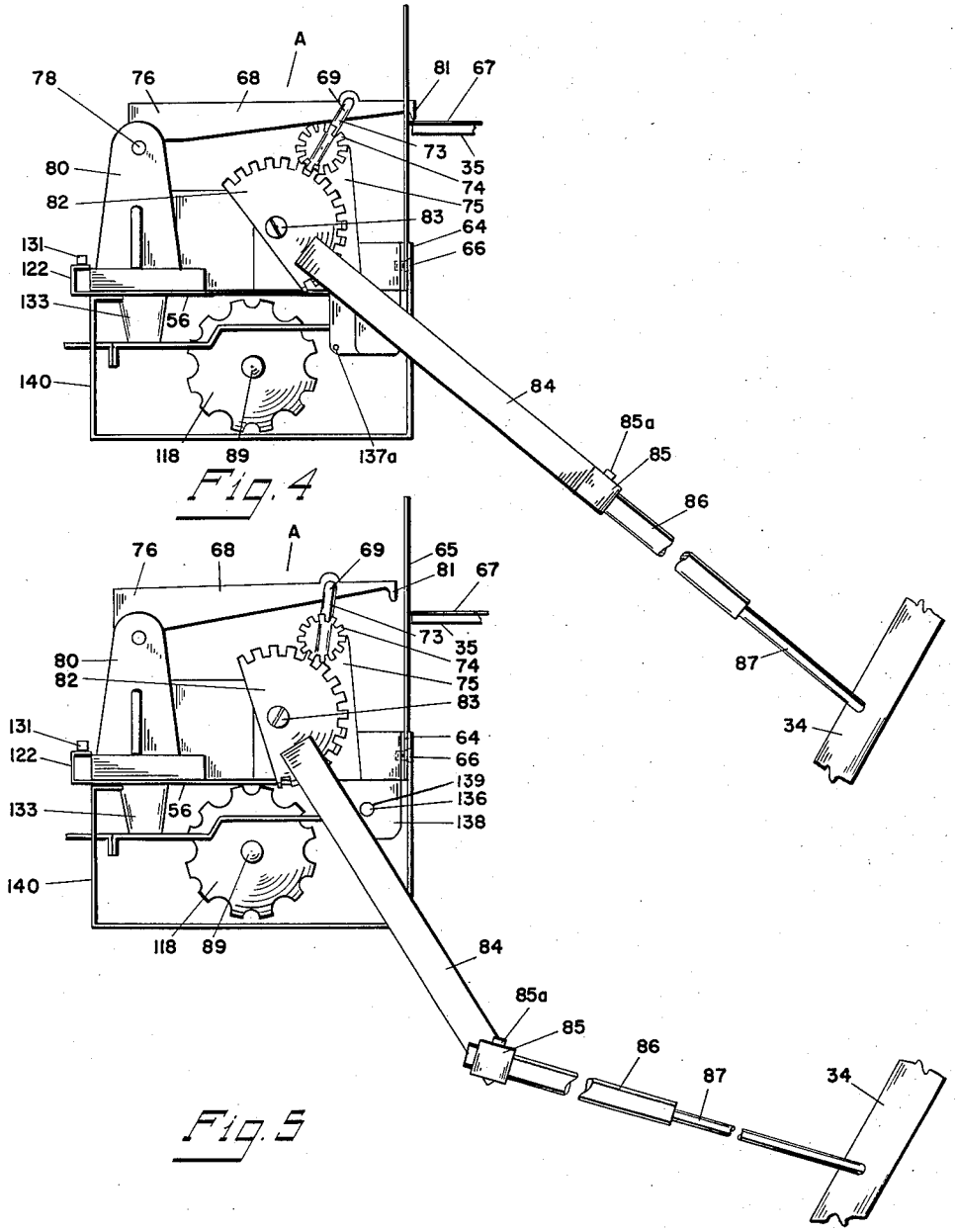

Fig. 4

Fig. 5

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AUTOMATIC PASTING MACHINE FOR PAPER SHEETS OR THE LIKE

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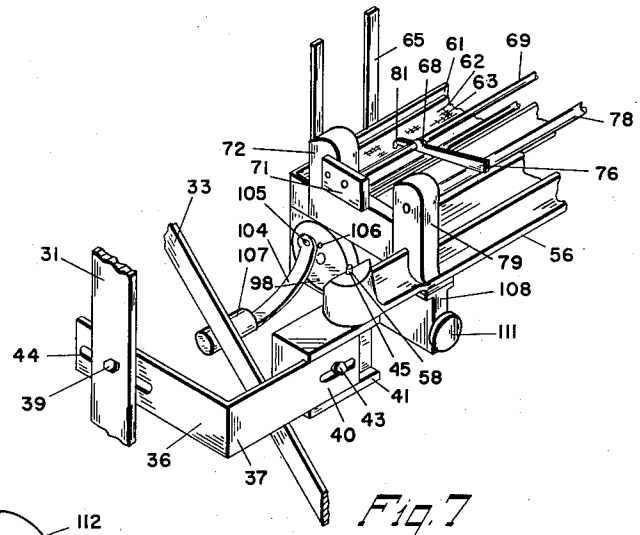

Fig. 7

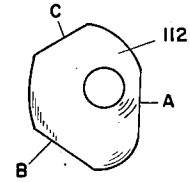

Fig. 19

Fig. 18

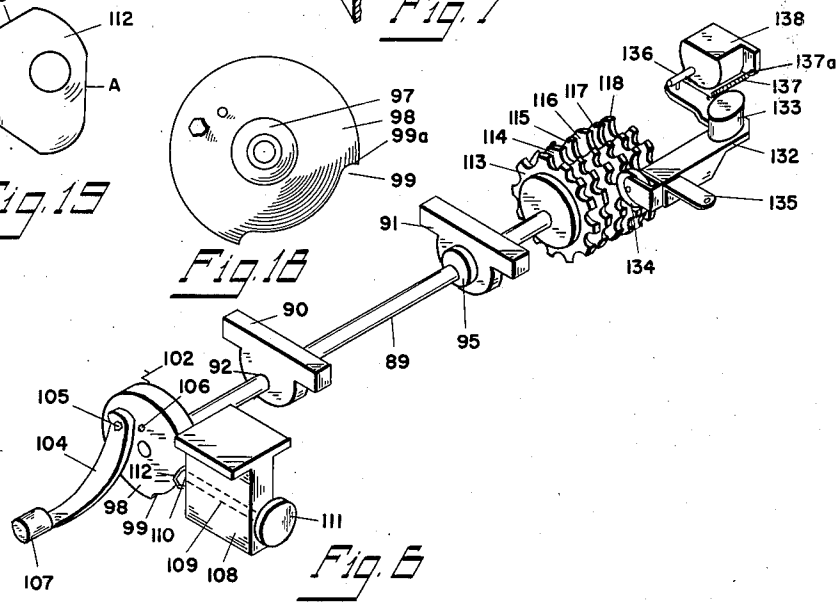

Fig. 6

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AUTOMATIC PASTING MACHINE FOR PAPER SHEETS OR THE LIKE

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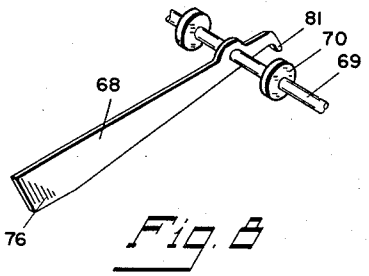

Fig. 8

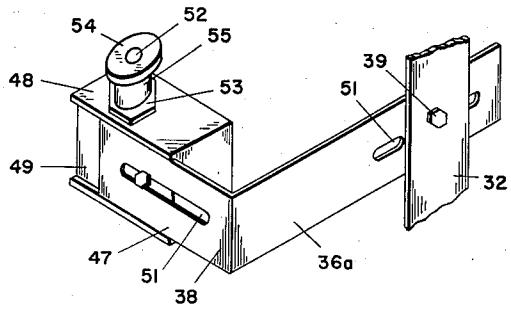

Fig. 17

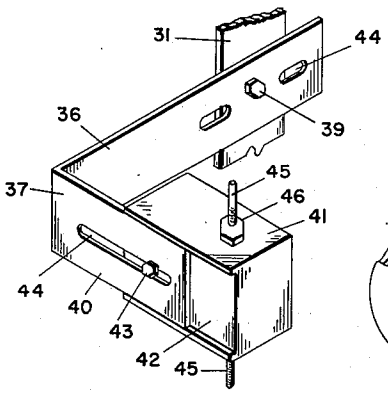

Fig. 16

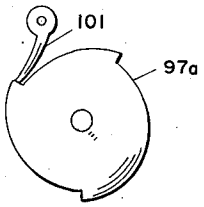

Fig. 20

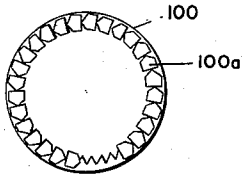

Fig. 9

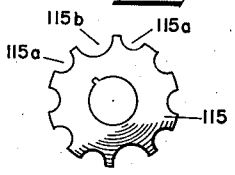

Fig. 10

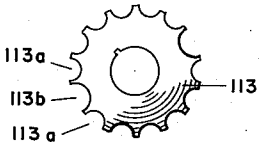

Fig. 11

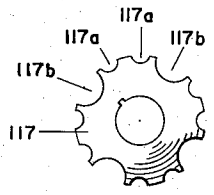

Fig. 12

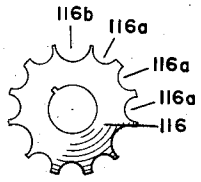

Fig. 13

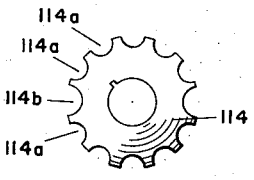

Fig. 14

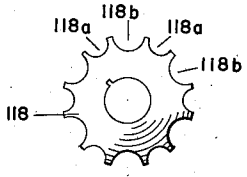

Fig. 15

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United States Patent Office 2,982,979
Patented May 9, 1961

2,982,979

AUTOMATIC PASTING MACHINE FOR PAPER SHEETS OR THE LIKE

Charles R. Patterson, 2728 Gregory St., Madison, Wis.

Filed May 11, 1959, Ser. No. 812,299

13 Claims. (Cl. 11—1)

This invention relates to improvements in devices for applying adhesive to corresponding edges of sheets of paper or the like to form sets of two or more sheets. The device is primarily intended to be an attachment coordinated with or otherwise connected to another sheet material handling machine, as, for example, a printing press or paper collator. Although attachment of my device to a printing press is principally referred to in this application, since the printing press illustrates and develops the use and capacity of the invention, it must be clearly understood that my attachment may be used with many other types of machines and combinations of machines, or as a part of a self-contained unit.

The present invention in general is concerned with improvements for certain purposes over the inventions disclosed in my co-pending application, Serial No. 657,407, filed May 6, 1957, now Patent No. 2,925,611, and constitutes a continuation-in-part of my said co-pending application.

An object of this invention is to provide a pasting machine for use with a printing press or any other machine which delivers sheets of paper to a delivery station, for applying adhesive to corresponding edges of a selected number of sheets in coordination with the delivery of sheets to the delivery station.

Another object of this invention is to provide an automatic pasting machine of the type referred to which is efficient and which eliminates the need for hand labor in pasting the edges of the sheets of paper or the like together.

A further object is to provide a pasting machine of the kind mentioned which may be attached directly to the delivery arms of the printing press, thereby operating in unison and synchronism with the press without interfering with the normal operations of the press.

An additional object of this invention is to provide a pasting machine of the kind referred to which continuously applies adhesive to corresponding edges of sheets of paper or the like to form sets of sheets of two sheets or more as may be predetermined, leaving each set separate from the other.

Another object of this invention is to provide a pasting machine of the type mentioned which is capable of applying adhesive to a selected number of sheets, then omitting adhesive from a sheet, and then continuing in a similar manner with the application of adhesive to another set of the selected number of sheets, followed by the omission of adhesive from a sheet, ad infinitum.

A further object of this invention is to provide a pasting machine as mentioned which comprises a compact single unit which may be easily and quickly attached to or removed from a printing press or similar machine. The machine may be swung aside when desired without complete removal from press or machine, and it is conveniently portable or easily stored when unattached.

A still further object is to provide a pasting machine of the type referred to wherein the means of adjustment for predetermining the number of sheets to be contained in each set of sheets, and the means of adjustment for increasing the amount of adhesive to each sheet are simple and convenient to operate.

Other objects and advantages will be apparent from the following description and drawings.

In the drawings:

Fig. 1 is a rear elevational view of my invention with the cover therefor broken away, showing attachment of the device to a printing press.

Fig. 2 is a perspective view of my invention looking down from one end with the cover and the adhesive applicator portion removed.

Fig. 3 is a fragmentary perspective view of my invention from approximately the same position as Fig. 2 with the cover and adhesive applicator thereon, and showing attachment of one end to a printing press.

Fig. 4 is a side elevational view of my invention showing the applicator in a position wherein the adhesive is being applied to the top sheet in the delivery station of the press.

Fig. 5 is a side elevational view of my invention similar to the view of Fig. 4, but showing the applicator being withheld or restrained from applying adhesive on to the sheet in the delivery station of the press.

Fig. 6 is a perspective view of my invention looking down from the end opposite that shown in Fig. 2, with the cover and the adhesive applicator removed.

Fig. 7 is a fragmentary perspective view of my invention from approximately the same position as Fig. 6 with a portion of the adhesive applicator thereon, and showing attachment to a printing press.

Fig. 8 is a perspective view looking down on an adhesive applicator arm as attached to its carrier bar.

Fig. 9 is a side elevational internal view of one form of a ratchet device used in the ratchet wheel.

Fig. 10 is a side elevational view showing one of the cams used to determine the number of sheets to be contained in a set.

Fig. 11 is a side elevational view showing another cam having the same purpose.

Fig. 12 is a side elevational view showing another cam having the same purpose.

Fig. 13 is a side elevational view showing another cam having the same purpose.

Fig. 14 is a side elevational view showing another cam having the same purpose.

Fig. 15 is a side elevational view showing another cam having the same purpose.

Fig. 16 is a perspective view looking down on one of the brackets for attaching my invention to a printing press.

Fig. 17 is a perspective view looking down on the other bracket for attaching my invention to a printing press.

Fig. 18 is a side elevational view showing the ratchet wheel and outer wheel which motivates the mechanism for determining the number of sheets in a set.

Fig. 19 is a side elevational view showing a cam which is in direct communication with the ratchet wheel shown in Fig. 18.

Fig. 20 is a side elevational internal view of another form of ratchet device used in the ratchet wheel.

In the accompanying drawings my pasting machine generally described as **30** may be used as any attachment for equipment handling paper or the like, but is especially useful in connection with a printing press and is shown secured to left printing press guard **31** and right printing press guard **32** at the delivery end of the press. Left delivery arm **33** and right delivery arm **34** of the press deposit sheets of printed matter on table **35** in the delivery station of the press. The delivery arms **33** and **34** of the press are actuated in oscillatory manner in the

conventional manner. As hereinafter shown the power requirements of my pasting machine are derived from the oscillation of the delivery arms 33 and 34, but does not interfere with the normal operations of the press.

My improved pasting machine is a compact single unit which is easily attached to a printing press or other machines. The drawings illustrate the attachment of my machine to press guards 31 and 32 respectively by outer legs 36 and 36*a* of L-shaped mounting brackets 37 and 38 with nuts and bolts or other means as at 39. The inner leg 40 of left L-shaped mounting bracket 37 is secured to mounting 41 within groove 42 by bolts or other means as at 43. Mounting bracket 40 carries elongated holes 44 for ready fitting to presses of varying size. Mounting 41 carries pin 45 the upper portion of which is unthreaded and the lower portion of which is threaded through mounting 41 with lock nuts 46 for ready vertical adjustment of my improvement on the press.

The inner leg 47 of right L-shaped mounting bracket 38 is secured to mounting 48 with groove 49 by bolts or other means as at 50. Mounting bracket 38 carries elongated holes 51 for ready fitting. Mounting 48 carries threaded pin 52 which is threaded through mounting 48 with lock nuts 53 for ready vertical adjustment of my improvement. Threaded pin 52 carries hand nut 54 with collar 55.

Frame member 56, which carries my attachment, has bored block 57 secured at one end with a bore 58 of sufficient size to accommodate pin 45. At the other end the extension 59 of frame member 56 carries a slot 60. In order to mount my device at the delivery end of the printing press mounting brackets 37 and 38 are respectively attached to printing press guards 31 and 32. The bore 58 of block 57 pivotally fits over pin 45. Frame member 56 is swung on pin 45 until it extends transversely across the delivery end of the press, with pin 52 fitting within slot 60. Hand nut 54 and collar 55 are turned on pin 52 to retain frame member 56 securely in position.

Frame member 56 has a recessed area 61 within which is seated a trough for adhesive reservoir 62 containing an adhesive. I have found that saturation of a sponge 63 which fits within the adhesive reservoir 62 with an appropriate adhesive is very satisfactory. Paper stop 64 is secured to frame member 56 by screws 66 forward of adhesive reservoir 62. Substantially parallel upwardly extending fingers 65 extend from the base of the paper stop 64, and the sheets of paper 67 delivered from the press are brought to rest against the fingers 65.

The adhesive applicator generally referred to as A consists of a plurality of arms 68 which are pivotally secured to carrier bar 69, and substantially prevented from horizontal movement by snug fitting rubber washers 70. Carrier bar 69 is secured at one end to crank 71 which is pivotally connected to bracket 72 which extends upward from frame member 56. The other end of carrier bar 69 is secured to crank 73 which is fixedly secured to gear wheel 74. Gear wheel 74 is pivotally secured to bracket 75 which extends upwardly from frame member 56. The tail portions 76 of arms 68 unattachedly rest upon applicator rest 78 which is rigidly secured to brackets 79 and 80 which extend upwardly from frame member 56. Each of the forward ends of arms 68 has a downturned finger 81 which is dipped into the adhesive which adhesive is then deposited on the edge of sheet 67 as the arms 68 oscillate forward and backward as hereinafter described.

Means for operation of the adhesive applicator, and the means for interrupting the application of the adhesive to selected sheets of paper in order to make set of sheets, are connected to and coordinated with the movement of the delivery arms 33 and 34 of the printing press. The means for oscillating the adhesive applicator arms 68 backward and forward consists of gear wheel 82 which

is pivotally secured to bracket 80 by bushing 83, and meshed with gear wheel 74. Gear wheel 82 carries a lever 84 which is pivotally connected to crank 85. Crank 85 carries collar 86 through which spring actuated push rod 87 passes. Push rod 87 terminates in crank 88 which is connected to delivery arm 34 of the printing press.

The programming means generally identified as P automatically interrupts the normal applicator stroke, restraining the adhesive applicator from coming in contact with the top sheet of paper 67 at regular intervals. This interruption of the applicator stroke permits the sheets to be glued together in sets of a predetermined number of sheets, such as 2, 3, 4, etc., sheets to a set. Thus, sheets of the same kind may be delivered, as where attached to a printing press only. Upon attachment to a printing press and carbon paper feeder or interleaver my device will automatically provide sets of printed sheets with carbon paper interleaved between them, with the sheets and carbon paper merely glued at one edge thereof for easy separation.

Shaft 89 is rotatably mounted through supporting brackets 90 and 91 and bearings 92 and 93 which are secured to frame member 56. Collars 94 and 95 with set screws 96 prevent horizontal movements of the shaft 89 within brackets 90 and 91. Ratchet wheel 97 is rigidly secured to shaft 89, and is revolvingly carried within outer wheel 98 which has notch 99 in its periphery. Outer wheel 98 carries well-known clutch device 100 with members 100*a* which grasp and turn shaft 89 when turned in one direction, but releases shaft 89 when turned in the other direction, similar to the usual ratchet action. Thus, ratchet wheel 97 is caused to turn when the outer wheel 98 is turned in one direction, but releases the ratchet wheel 97 when the outer wheel is turned in the other direction. A conventional ratchet 97*a* and pawl 101 arrangement may be used in like manner as shown in Fig. 20, where pawl 101 is pivotally secured within ratchet wheel 97 and engages notched ratchet 97*a* as to turn shaft 89 when turned in one direction, but without turning it in the other direction. Spring 102, which extends from frame member 56 to pin 103 on outer wheel 98, causes outer wheel 98 to return to the position shown in Figs. 2 and 6.

Reciprocating arm 104 is pivotally secured by bolt 105 to the opposed side of outer wheel 98. Outer wheel 98 also carries pin 106 which limits the backward movement of reciprocating arm 104. Reciprocating arm 104 carries crank 107 which is in reciprocating engagement with delivery arm 33 of the printing press.

Support member 108 is secured to frame member 56 and has a bore 109 (dotted lines in Fig. 6), through which rotatable pin 110 is extended. Knob 111 is secured to the outer end of pin 110 and cam 112 is secured to the other end of pin 110. Knob 111 may be marked with letters A, B, C, etc., or other appropriate markings to correspond with the various surfaces A, B, C, etc., of cam 112.

Cams 113, 114, 115, 116, 117 and 118 are carried near the opposed end of shaft 89, and are horizontally slidable as a group on the shaft. Cams 113–118, inclusive, are moved back and forth on shaft 89 as may be necessary to provide for the desired number of sheets of paper in each set of sheets. These cams are moved on shaft 89 by pin 119 which extends downward from adjustment bar 120. Adjustment bar 120 is pivotally secured to frame member 56 at 121. The other end 122 of adjustment bar 120 extends over edge portion 123 of frame member 56, with holes 124 of adjustment bar 120 in communication with the respective holes 125—130 of frame member 56 as the end 122 of adjustment bar 120 is drawn along edge portion 123 of frame member 56 on pivot 121. Lock pin 131 may be placed through holes 124 of adjustment bar 120 and one of the holes 125—130 on frame member 56 to retain the cams 113—118 in such stationary horizontal position as may be desired.

L-shaped stop control member **132** is pivotally secured to support member **133** extending from frame member **56** and at one end carries wheel cam follower **134** and has lever **135** adjacent said end. The other end of stop control member **132** is pivotally connected to stop member **136**. Spring **137** connected near the latter end of the stop control member extends to support member **138** at **137***a* so as to retain tension of wheel cam follower **134** against the respective cams **113—118**. Stop member **136** is in slidable communication with aperture **139** of support member **138**.

The programming part P of invention secured beneath frame member **56** may be enclosed by box **140** with appropriate apertures **141** to accommodate outward extending lever **135** and knob **111**.

Operation

In operation my machine is attached to the printing press at the delivery end adjacent to table **35** in the manner above-described. It does not interfere in any way with the normal operation of the printing press. Push rod **87** is easily engaged with or disengaged from delivery arm **34** by removing crank **88** from the hole in the delivery arm, and reciprocating arm **104** is likewise easily engaged with or disengaged from connection with delivery arm **33** by bolt **105**. My attachment will apply adhesive to the edges of sheets in sets of two or more sheets, without an application of adhesive to the top sheet of each set. By simple adjustment hereinafter described my machine is capable of automatically providing sets of two or more sheets, as desired, depending upon the particular job order, so that sets of two sheets, or three sheets, or four sheets, or more, may be provided.

As the printing press delivers freshly printed sheets to table **35** of the printing press delivery station, they move to fingers **65** of paper stop **64** and are brought to rest on table **35**. As each sheet is so delivered my machine is set in motion, being motivated by and in coordination with delivery arms **33** and **34** which move in unison. As the delivery arm **34** moves to the position in relation to lever **84** and push rod **87** shown in Fig. 3, the applicator arms **68** are moved in unison to the adhesive-obtaining position with applicator fingers **81** in contact with the adhesive in adhesive reservoir **62**. This is accompanied by a simultaneous movement of applicator arms **68** which are pivotally secured to carrier bar **69**, the tail portions of said applicator arms resting on applicator rest **78**. The depth to which the applicator fingers **81** are extended into applicator reservoir **62** may be adjusted by adjusting the length of the stroke of lever **84**, collar **86** and push rod **87**. Such adjustment may be made by loosening bolt **85***a* and sliding collar **86** within crank **85** to the desired position, and then tightening bolt **85***a* to maintain the desired length of stroke.

As delivery arms **33** and **34** move further in their single cycle of operation and in a direction to obtain another sheet for the delivery station, the applicator arms **68** are oscillated from the position shown in Fig. 3 to the position shown in Fig. 4 as gear wheel **74** is turned as a result of the movement of delivery arm **34**. As shown in Fig. 4 the applicator fingers **81** in unison gently touch the top sheet **67** and apply adhesive thereto to cause the set of sheets to stick together. Then, as delivery arms **33** and **34** are ready for another stroke the applicator arms **68** and fingers **81** are returned toward the position shown in Fig. 3.

Simultaneously with the above-described movement of the applicator means A the oscillation of reciprocating arm **104** through its contact with delivery arm **33** sets in motion the means for interrupting the application of adhesive at fixed intervals in order to provide sets of the sheets with a specified number of sheets. The movement of reciprocating arm **104** causes outer wheel **98** to turn a part of a revolution. As members **100***a* grip shaft **89** (or as pawl **101** engages ratchet **97***a*) shaft **89** is caused to rotate with the outer wheel **98**. Spring **102** causes outer wheel **98** to return to its original position with the ratchet action therein in disengaged relation, so that shaft **89** does not turn when wheel **98** returns to such original position. The distance that outer wheel **98** and shaft **89** rotate is adjusted by the turning of knob **111** to the position A, B, or C, which in turn determines whether surface A, B or C of cam **112** will rest against the shoulder **99***a* of notch **99** of the outer wheel **98**. It will be noted that each of the surfaces A, B, and C of cam **112** has a different distance from the center of pin **110**, and thereby the distance of rotation of wheel **98** and shaft **89** will vary depending upon the adjustment of knob **111**.

The number of sheets in each set is then determined by the respective cams **113—118** in relation to the distance that shaft **89** is turned and in cooperation with wheel cam follower **134**. To illustrate, if sets of three sheets are to be produced the cams are positioned by moving end **122** of adjustment bar to the hole **126** which carries the number "3" until wheel cam follower **134** is in communication with cam **117**, and knob **111** is turned so as to have surface A of cam **112** against the shoulder **99***a* of outer wheel **98**. When wheel cam follower **134** travels in each of notched surfaces **117***a* the cycle of the adhesive applicator A is complete from adhesive reservoir to the application of the adhesive to the edge of top paper **67**. However, when cam **117** revolves sufficiently so that wheel cam follower **134** travels in the deeper notch **117***b* of cam **117** as a result of the tension of spring **137**, stop member **136** is caused to extend outwardly from support member **138** in the path of lever **84**. Thus, lever **84** is prevented from making a full swing by the projection of stop member **136** and applicator fingers **81** are restrained from contacting sheet **67** as shown in Fig. 5. In such case the movement of delivery arm **34** is absorbed by the spring (not shown) within collar **86**. Hence, adhesive is applied to two successive sheets delivered to table **35** and no adhesive is delivered to the third or top sheet, so that a set of three sheets is produced.

Likewise, if a set of seven sheets is desired knob **111** is turned so that surface C of cam **112** is in contact with shoulder **99***a* of outer wheel **98**. Adjustment bar end **122** is moved to the number "7" hole (**130**) on edge portion **123**, and wheel cam follower **134** is in communication with cam **113**. With such adjustment adhesive is applied to six successive sheets by applicator fingers **81**, and no adhesive is applied to the seventh or top sheet of the set. It is obvious that with variations in cam **112** and cams such as those at **113** to **118**, sets containing almost any number of sheets may be produced, as desired.

It is to be understood that the present invention is not confined to the particular construction and arrangement of parts herein illustrated, but embraces all such modifications and alterations thereof, as may come within the scope of the following claims.

I claim:

1. A machine for applying adhesive to corresponding edges of sheets of paper to form sets which are constituted by two or more sheets comprising a power driven means, adhesive applicator means which is subjected to an oscillatory motion by said power driven means, an adhesive reservoir, means connecting said appliactor means to said power driven means for driving said applicator means in a cyclic movement between said reservoir and said sheets in synchronization with said power means, interrupting means for preventing said applicator means from depositing adhesive on a selected sheet in each of said sets of sheets, said interrupting means comprising a stop adapted to be contacted by said means connecting the applicator means to the power means when said stop is actuated, ratchet means in communication with cam means, said cam means being in communication with said stop means for determining the number of sheets to which

adhesive is to be applied before said interrupting means is actuated, means connecting said ratchet means to said power driven means for driving said ratchet and cam means in synchronization with said applicator means.

2. The machine of claim 1 including manual means for adjusting the number of sheets of paper in each set.

3. The machine of claim 1 including means for adjusting the amount of adhesive carried by said applicator means.

4. An attachment for applying adhesive to corresponding edges of sheets of paper to form sets which are constituted by two or more sheets, said attachment comprising a support, means for mounting said support, an adhesive reservoir carried by said support, an adhesive applicator, means pivoted to said support and mounting said applicator for oscillation during which said applicator is successively placed in said reservoir at one end of an oscillatory stroke and moved into an adhesive applying position at the other end of the stroke, means to oscillate said applicator mounting means, programmed means for temporarily holding a portion of said means to oscillate the applicator and thereby restrain the applicator from moving to the sheet contacting position, including a rotatable shaft attached to said support, adjustable ratchet means operatively connected with said shaft, means for rotating said shaft in unison with said applicator mounting means, a stop adapted to be contacted by said applicator oscillating means when said stop is actuated, cam means secured to said shaft in operative communication with said stop for determining the number of sheets to which adhesive is to be applied before said stop is actuated, and means connecting said stop with said cam means to actuate said stop.

5. The invention of claim 4 including manual means for adjusting the number of sheets of paper in each set.

6. The invention of claim 4 including means for adjusting the amount of adhesive carried by said applicator.

7. In a printing press having a power driven means for delivering sheets to a station, a device adapted for attachment to said press for applying adhesives to corresponding edges of said sheets to form sets which are constituted by two or more sheets, said device comprising an adhesive applicator which is subjected to an oscillatory motion by said power driven means, an adhesive reservoir, means connecting said applicator to said power driven means for driving said adhesive applying means in a cyclic movement between said reservoir and said sheets in synchronization with said power driven means, adjustable means for interrupting the movement of said means between said sets of sheets, said interrupting means comprising stop means adapted to be contacted by said means connecting said applicator to said power driven means when said stop is actuated, adjustable ratchet means in operative communication with cam means, said cam means being in communication with said stop means for determining the number of sheets to which adhesive is to be applied before said interrupting means is actuated, means operatively connecting the said ratchet means to said power driven means for driving said ratchet and cam means in synchronization with said applicator.

8. The invention of claim 7 including means for horizontal and vertical adjustment of said attachment in relation to said printing press.

9. The invention of claim 7 including pivotal means for securing said attachment to the printing press to permit said attachment to be swung away from the station when not in use.

10. An attachment for applying adhesive to corresponding edges of sheets of paper to form sets which are constituted by two or more sheets, said attachment comprising a support, means for mounting said support, an adhesive reservoir carried by said support, an adhesive applicator, means pivoted to said support and mounting said applicator for oscillation during which said applicator is successively placed in said reservoir at one end of an oscillatory stroke and moved into an adhesive applying position at the other end of the stroke, means to oscillate said applicator mounting means, programmed means for temporarily holding a portion of said means to oscillate the applicator and thereby restrain the applicator from moving to the sheet contacting position, said programmed means including a rotatable shaft attached to said support, ratchet means operatively connected with said shaft, means for rotating said shaft in unison with said applicator mounting means, a stop adapted to be contacted by said applicator oscillating means when said stop is actuated, cam means secured to said shaft in operative communication with said stop for determining the number of sheets to which adhesive is to be applied before said stop is actuated, means connecting said stop with said cam means to actuate said, stop, means for adjusting said cam means and thereby select the number of sheets of paper in each set.

11. The invention of claim 10 wherein the means for actuating said stop are spring means.

12. The invention of claim 10 wherein the means for adjusting said cam means include a lever pivotally secured to said support, said lever being in communication with numerals on said support specifying the number of sheets in each set at any respective location of said lever.

13. The invention of claim 7 wherein the cam means include a plurality of substantially circular cams having notched areas on the periphery thereof, each of said cams having an arrangement of notches different from that of the other cams with intervening larger notches spaced therein, a spring actuated stop control member pivotally secured to said support carrying a cam follower in communication with the periphery of one of said cams at one end and carrying said stop means at the other end.

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