June 19, 1951 C. F. SCHAEFER 2,557,696

GLUE APPLYING MACHINE

Filed Dec. 17, 1949 2 Sheets-Sheet 1

Fig. 1

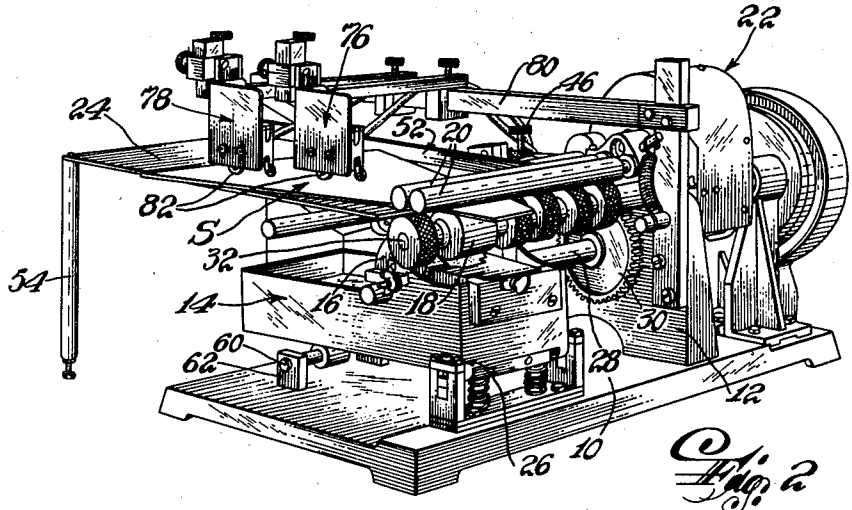
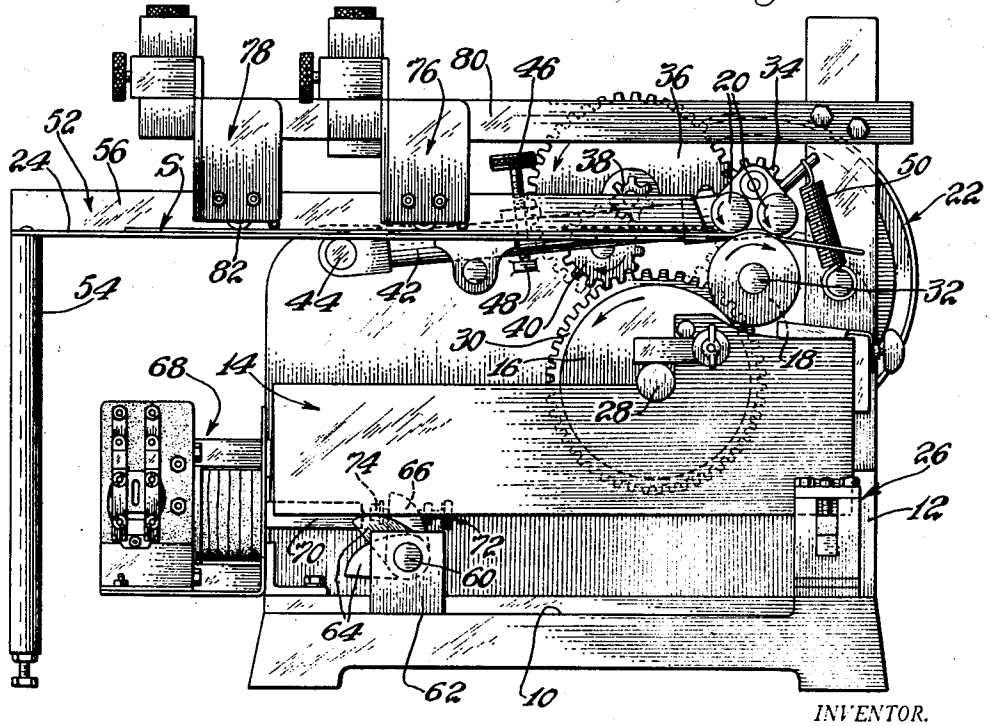


Fig. 2



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Fig. 3

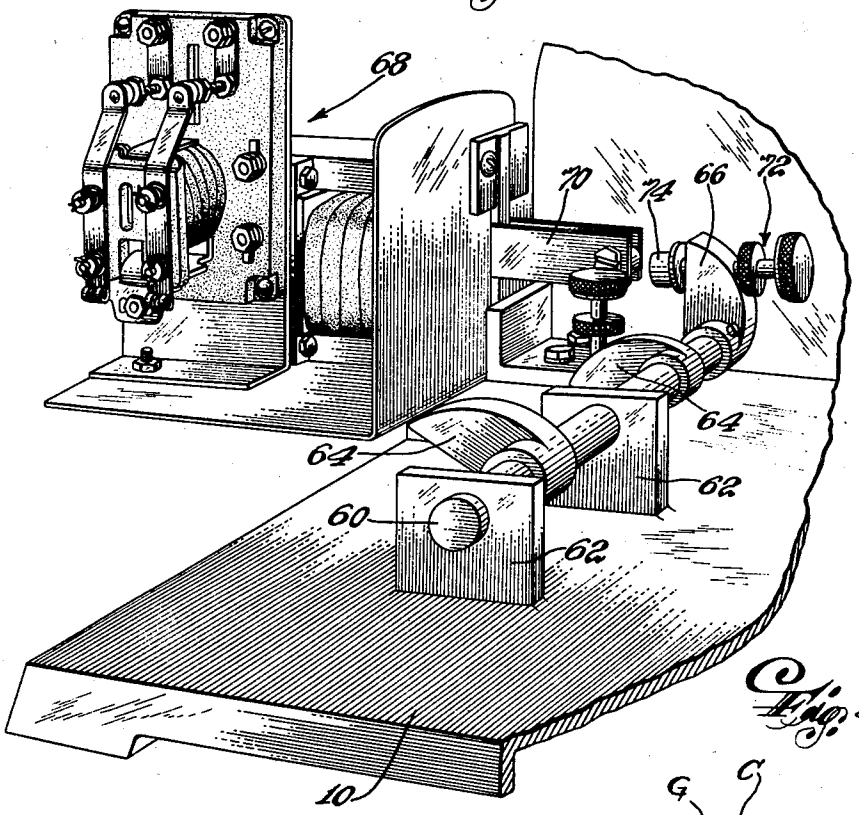


Fig. 4

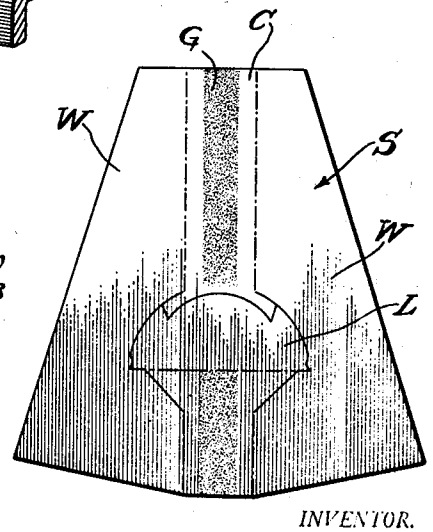


Fig. 5

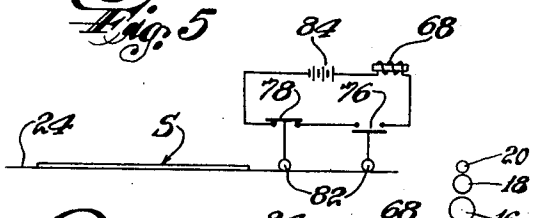


Fig. 6

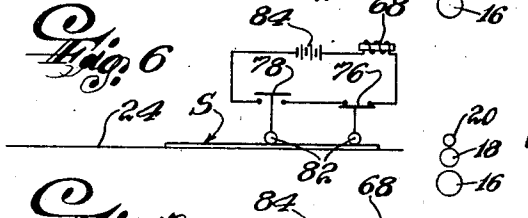
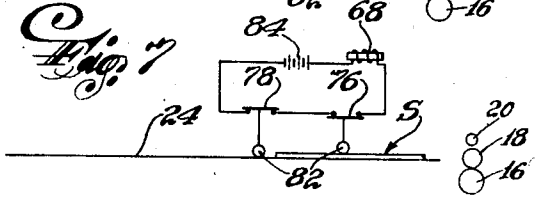


Fig. 7



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Patented June 19, 1951

2,557,696

UNITED STATES PATENT OFFICE

2,557,696

GLUE APPLYING MACHINE

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Application December 17, 1949, Serial No. 133,564

16 Claims. (Cl. 91—50)

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This invention relates to improvements in glue applying machines and the like, and is particularly directed to a machine for applying a strip of glue or other coating material to articles such as, for example, sheets and the like.

The present invention aims to provide such a machine wherein the coating material may be applied to the articles in interrupted stripes of predetermined lengths.

There are many articles which require the application of coating material in interrupted stripes, wherein the stripes have heretofore been applied by hand. One of such articles is a cardboard double winged easel which requires the application of a stripe of adhesive, whereby the same may be secured to a display card or other article to be supported thereby. Such an easel has a portion substantially midway of its ends which is adapted to be folded outwardly of the plane of the easel to maintain the wings in their article supporting position, and accordingly, it is not desired that the said portion receive a coating of glue since it is not to be glued to the article to be supported. Heretofore, the stripes of glue have been applied manually by means of a brush to such easels, which is a relatively slow and expensive method.

Accordingly, an object of the present invention resides in the provision of a machine for applying interrupted stripes of coating material to articles, which is relatively simple and economical in construction, is automatic in operation, and can readily withstand such rough usage to which it may normally be subjected.

Another object resides in the provision of means for controlling the interruption of the application of the stripe of coating material to the object to be coated, which means can be readily applied to newly designed machines as well as to machines of existing types.

A further object is to provide such means which are readily adjustable to predetermine the length of the zone at which the coating is interrupted.

A still further object is to provide a machine of the character indicated wherein the controlling means may be rendered ineffective at will, whereby the machine is then adapted to apply a continuous or uniform stripe.

A still further object of the invention resides in the provision of a machine of the character indicated which can readily be adjusted to vary the thickness of the coating material applied to the articles in either interrupted or continuous stripes.

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Other and further objects of the present invention will be manifest from the following description and the accompanying drawings.

In accordance with the invention, the foregoing objects are accomplished by providing a glue applying machine comprising in combination a source of glue, or the like, a glue applying roller, a roller for transferring glue from the source and supplying the same to the glue applying roller, and means responsive to the movement of the member or article to which glue is to be applied for varying the relative position of the rollers to thereby vary the nip therebetween to control the supply of glue to the glue applying roller.

In a preferred embodiment of the invention about to be described, the foregoing elements are arranged so that a stripe of glue is applied to a sheet with the stripe being interrupted for a portion thereof by increasing the nip to an extent to prevent the transfer of glue. However, the present invention contemplates that these elements may be arranged in a manner so that a stripe of glue is applied to only a portion of the sheet by normally preventing the transfer of glue and rendering the rollers effective for the transfer and application of glue only at desired intervals. Alternately, the thickness of the coating may be increased or decreased along the length of the stripe by rendering the rollers only partly effective to transfer and apply glue at desired intervals.

A preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a machine in accordance with the present invention;

Fig. 2 is a side elevational view of the machine shown in Fig. 1;

Fig. 3 is an enlarged fragmentary perspective view illustrating in detail the elements for raising and lowering the glue tank whereby the relative positions of the tank and glue rollers may be varied;

Fig. 4 is a plan view of an article such as a sheet of material having an interrupted stripe of glue applied thereto; and

Figs. 5, 6 and 7 are schematic views of the electric circuit for controlling the positioning of the tank and glue rollers, including switch elements engaged by the sheet, illustrating various circuit controlling positions of the switch elements in relation to the sheet moving towards the glue applying roller.

Referring to the drawings in detail and more particularly to Figs. 1 and 2 thereof, there is shown a glue applying machine embodying the present invention, which, by way of example, may be of the general type illustrated in my co-pending application for United States Letters Patent, Serial No. 707,418, filed November 2, 1946, now Patent No. 2,493,165, issued January 3, 1950.

The machine generally comprises a bed or base 10, an upright or vertical wall or frame 12 on the base, a glue tank 14 on the base at one side of the wall, a tank roller 16 supported on the tank, a glue applying roller 18 normally in operative contact with the tank roller, feed rollers 20 co-operating with the glue applying roller for feeding a sheet S therebetween, drive means such as a motor 22 at the other side of the wall for effecting rotation of the aforementioned rollers, a feed table or platform 24 for the sheet and mechanism for varying the relative positions of the tank and glue applying rollers including control elements above the platform responsive to the sheet as will be described in detail hereinafter.

One end of the tank 14 is pivotally supported by suitable means 26 on the base 10, and the other end of the tank is supported on elements of the mechanism just mentioned for effecting the raising and lowering of the tank about its pivoted end. The tank roller 16, extending into the tank, is mounted for rotation with a shaft 28 supported in suitable bearings on the tank, whereby the tank roller is adapted to be raised and lowered with the tank, and a gear 30 is secured to the shaft at the end adjacent the wall 12.

The glue applying roller 18 is mounted for rotation with a shaft 32 extending through and journalled for rotation in the wall 12. This shaft is driven by the motor 22 in any suitable manner in a clockwise direction, as viewed in Figs. 1 and 2, and a train of gears (not shown) is in operative connection with the shaft 32 for effecting rotation of the feed rollers 20 in a counterclockwise direction, as viewed in Figs. 1 and 2, and rotation of a gear 34 in a direction to thereby effect rotation of the gear 30, shaft 28 and tank roller 16 in a counterclockwise direction through a train of gears 36, 38 and 40.

The feed rollers 20 are mounted adjacent the free end of an arm 42 pivotally mounted at its other end 44 on the wall 12. Means, such as a screw 46 on the arm engaging a stop 48 on the wall, are provided for raising and lowering the arm to adjust the position of the feed rollers 20 with respect to glue roller 18 to feed sheets of various thicknesses between the rollers 18 and 20. A torsion spring 50 having its ends connected to the wall 12 and the arm 42, respectively, urges the arm downwardly so that the screw 46 bears against its stop 48 and the rollers 20 are yieldably positioned for cooperation with the roller 18.

The feed table or platform 24 is supported in any suitable manner, for example, by an angle bar 52 mounted on the wall 12 and a vertical leg 54. The upright flange 56 of the bar 52 may serve as a guide for the edge of the sheet fed between the rollers 18 and 20.

As shown more particularly in Fig. 3, the mechanism for raising and lowering the tank 14 comprises a shaft 60 journalled for rotation in lugs 62 on the base 10 adjacent the end of the glue tank 14 opposite the pivoted end. Arms, fingers, cams or eccentric members 64 are mounted for rotation with the shaft and are adapted to support the tank and effect raising and lowering thereof, an arm 66 at one end of the shaft and

adjacent one side of the tank, a solenoid 68, preferably of the relay controlled type having an armature or plunger 70, and a member 72 screw threaded through the arm 66 having a stop 74 adapted to be adjustably positioned for engagement by the plunger upon energization of the solenoid.

As illustrated herein, the tank normally rests on the arms 64 in its lower position with the tank roller 16 in operative contact with the glue roller 18 to supply glue thereto, and the plunger 70 is in inward position and out of contact with the stop 74 but is adapted to engage the stop and rock the shaft 60 to raise the end of the tank upon energization of the solenoid whereby the nip between the rollers 16 and 18 is increased to an extent whereby glue will not pass therebetween and glue will not be supplied to the roller 18 for application to the sheet S.

The energization of the solenoid is controlled by a pair of switch elements 76 and 78 mounted on a bar 80 supported by the wall or frame 12 for lengthwise or transverse adjustment with respect to the platform. Each of the switch elements includes a member such as a roller 82 for engaging the sheet S and linked to a switch operating arm in a suitable manner.

In Fig. 4, a sheet S is illustrated, which is by way of example a double winged easel for a display card or the like comprising a central section C, foldable wings W at the sides, and a locking tab L cut out of the sheet and adapted to be folded outwardly out of the plane thereof to maintain the wings in their card supporting position. The central section C has a stripe of glue G thereon for securing the easel to the card, but the stripe is interrupted at the portion where the tab L is located by utilizing the machine of the present invention to apply the stripe of glue.

The operation of the machine herein as controlled by the sheet to interrupt the stripe of glue is illustrated schematically in Figs. 5, 6 and 7. To accomplish this, the switch elements 76 and 78 are connected in a series circuit with the solenoid 68 and a source of electrical energy such as a battery 84.

As shown in Fig. 5, the switch 76 normally is open and the switch 78 normally is closed when the contact rollers 82 thereof rest on the platform 24, whereby the solenoid is deenergized and the roller 16 supplies glue to the roller 18.

As shown in Fig. 6, when the sheet S is interposed between the rollers 82 and the platform 24, the switch 76 is opened and the switch 78 is closed, whereby the tank still is in its lower position and glue supplied to the roller 18 will be applied to a sheet when it passes between the rollers 18 and 20.

As the sheet is advanced between the glue applying roller 18 and the feed roller 20, the switch 76 is retained in its closed position but as the trailing edge of the sheet passes between the roller of the switch 78 and the platform this switch is permitted to close (Fig. 7), whereby the solenoid 68 is energized, the tank 14 is raised and the roller 16 is brought in such close contact with the roller 18 that glue cannot pass therebetween. Consequently, a circumferential portion of the roller 18 will not have glue thereon for application to the sheet, the switch elements being so spaced and positioned with relation to the roller 18 that the portion of the sheet at which the stripe G is to be interrupted passes

between the rollers 18 and 20 while this condition exists.

Upon further advance of the sheet, the trailing edge thereof passes between the roller 82 of the switch 76 and the platform to permit this switch to open, whereby the solenoid is deenergized, the tank 14 is permitted to be lowered, and the roller 16 is again effective to supply glue to the roller 18 to complete the stripe.

While one embodiment of mechanism for controlling the relative positions of the rollers 16 and 18 has been described herein by way of example, it will be understood that other forms of mechanism could be utilized to accomplish a similar purpose without departing from the concept of the present invention. Also, while the present invention has been described in connection with a gluing machine, it is to be understood that it is in no way limited thereto, it being contemplated that the machine can be utilized for coating sheets, objects and the like with any suitable coating material and that the roller 18 can be utilized for printing indicia or applying other matter on the sheets or the like when the tank 14 is used as an ink reservoir.

From the foregoing description, it will be seen that the present invention provides a novel, simple and practical machine for coating sheets and the like, wherein the coating is interrupted for a portion of the sheet or wherein the thickness of the coating may be varied. The machine is rugged in construction and can readily withstand such rough usage to which it normally may be subjected. The machine furthermore is readily adjustable to facilitate its use for accomplishing a great variety of purposes.

It will also be seen from the foregoing description that the length of the uncoated portion of the article is controlled by the spacing of the switch elements, so that the length of the uncoated portion can be varied by varying the spacing of the said elements. Such variation of the spacing is readily accomplished by moving the elements relative to each other along the bar 80.

While I have illustrated and described a preferred embodiment of my invention, it is to be understood that I do not wish to be limited to that precise embodiment, as obviously various changes and modifications may be made therein without departing from the spirit and scope of the invention.

What I claim is:

1. In a coating machine of the class described, the combination of means providing a source of coating material, a transfer roller adjacent said means for applying coating material to an article to be coated, a roller positioned in contact with said source and in operative contact with said transfer roller for supplying coating material thereto, movable means supporting said coating supplying roller, and means actuated by the article as it is being coated and responsive to the position of the latter relative to that of said transfer roller for displacing said movable supporting means and thereby varying the relative position of said transfer roller and said coating supplying roller to control the supply of coating material to said transfer roller.

2. In a glue applying machine, the combination of means providing a source of glue, a glue applying roller adjacent said means, a roller positioned in said source and in operative contact with said glue applying roller for supplying glue thereto, a feed roller cooperating with said glue applying roller for moving a sheet to which glue is to be applied therebetween, movable means supporting said glue supplying roller, and means actuated by the sheet to which glue is being applied and responsive to the movement of said sheet for displacing said movable supporting means and thereby varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller.

3. In a glue applying machine the combination of a pivotally mounted glue tank, a glue applying roller mounted above said tank for applying glue to an article, a tank roller mounted on and positioned in said tank and in operative contact with said glue applying roller for supplying glue thereto, means for moving said tank about its pivot to vary the relative position of said glue applying roller and said tank roller to control the supply of glue to said glue applying roller, and means responsive to the movement of said article as glue is applied to the latter for controlling the operation of said last mentioned means.

4. In a glue applying machine, the combination of a pivotally mounted glue tank, a glue applying roller mounted above said tank, a tank roller mounted on and positioned in said tank and in operative contact with said glue applying roller for supplying glue thereto, a feed roller cooperating with said glue applying roller for moving a sheet therebetween to receive the glue from said applying roller, means for moving said tank about its pivot to vary the nip between said tank and glue applying rollers to interrupt the supply of glue to said glue applying roller, and means responsive to the position of the sheet as glue is applied to the latter for controlling the operation of said last mentioned means.

5. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with said glue applying roller for supplying glue thereto, movable supporting means for said glue supplying roller, means for displacing said movable supporting means and thereby varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller, and means for controlling the operation of said last mentioned means including a pair of spaced elements to be actuated by the sheet to which the glue is being applied while the latter is fed to said glue applying roller.

6. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with said glue applying roller for supplying glue thereto, means for varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller, an electrical circuit including means for controlling the operation of said last mentioned means, and switch means positioned for engagement by the sheet to which the glue is being applied for controlling said circuit.

7. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying

glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with said glue applying roller for supplying glue thereto, means for varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller, an electrical circuit including a solenoid for controlling the operation of said last mentioned means, and switch means positioned for engagement by the sheet to which the glue is being applied for controlling said circuit.

8. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with said glue applying roller for supplying glue thereto, means for varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller, an electrical circuit including means for controlling the operation of said last mentioned means, and a pair of switch elements positioned for engagement by the sheet to which the glue is being applied for controlling said circuit.

9. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with said glue applying roller for supplying glue thereto, means for varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller, and an electrical circuit including electro-magnetic means for controlling the operation of said last mentioned means and a pair of switch elements connected in series and positioned for engagement by the sheet to which the glue is being applied for controlling said circuit, one of said switch elements being normally open and said other switch element being normally closed, said normally closed switch element being adapted to be opened by engagement of the sheet and said normally open switch element being adapted to be closed by engagement of the sheet.

10. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with said glue applying roller for supplying glue thereto, means for varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller, an electrical circuit including electro-magnetic means for controlling the operation of said last mentioned means and a pair of spaced switch elements connected in series and positioned for engagement by the sheet to which the glue is being applied while such sheet is being fed to said glue applying roller for controlling said circuit, said switch element nearest said glue applying roller being normally open and said other switch element being normally closed, said normally closed switch element being adapted to be opened by engagement of the sheet, and said open switch element being adapted to be closed by engagement of the sheet.

11. In a glue applying machine, the combination of a glue tank pivotally mounted at one end thereof, a roller mounted above said tank adjacent the pivoted end thereof for applying glue to a sheet, means above said tank for supporting the sheet, a tank roller mounted on and positioned in said tank and in operative contact with said glue applying roller for supplying glue thereto, and an electrical circuit including electro-magnetic means for raising the end of said tank opposite said pivoted end to thereby vary the nip between said tank and glue applying rollers to thereby interrupt the supply of glue to the latter, an electric energizing circuit connected to said electro-magnetic means, and a pair of switch elements connected in series in said circuit and mounted above said sheet supporting means and positioned for engagement by the sheet to which the glue is being applied while such sheet is being fed to said glue applying roller.

12. In a glue applying machine, the combination of a glue tank pivotally mounted at one end thereof, a roller mounted above said tank adjacent the pivoted end thereof for applying glue to a sheet fed past the roller, means above said tank for supporting the sheet, a tank roller mounted on and positioned in said tank and in operative contact with said glue applying roller for supplying glue thereto, an electrical circuit including electro-magnetic means for raising the end of said tank opposite said pivoted end to thereby vary the nip between said tank and glue applying rollers to thereby interrupt the supply of glue to the latter, a pair of switch elements connected in series in said electrical circuit and mounted above said sheet supporting means and spaced from said glue applying roller and positioned for engagement by the sheet to which the glue is being applied while such sheet is being fed to said glue applying roller, and means for adjusting the spacing of said switch elements.

13. In a glue applying machine, the combination of a glue tank pivotally mounted at one end thereof, a roller mounted above said tank adjacent the pivoted end thereof for applying glue to a sheet fed past the roller, means above said tank for supporting the sheet, a tank roller mounted on and positioned in said tank and in operative contact with said glue applying roller for supplying glue thereto, an electrical circuit including electro-magnetic means for raising the end of said tank opposite said pivoted end to thereby vary the nip between said tank and glue applying rollers and interrupt the supply of glue to the latter, a pair of switch elements connected in series in said circuit and mounted above said sheet supporting means and spaced from said glue applying roller and positioned for engagement by the sheet to which the glue is being applied while such sheet is being fed to said glue applying roller, and means for adjusting the spacing of said switch elements, one of said switch elements being normally open and said other switch element being normally closed, said normally open switch element being adapted to be closed by engagement of the sheet and said normally closed switch element being adapted to be opened by engagement of the sheet.

14. A glue applying machine according to claim 13 wherein a feed roller is positioned above said glue applying roller and adjacent said sheet supporting means for feeding the sheet to said glue applying roller.

15. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with

said glue applying roller for supplying glue thereto, means for varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying roller, means for controlling the operation of said last mentioned means including a pair of spaced elements adapted to be engaged by the sheet to which the glue is being applied while such sheet is being fed to said glue applying roller, and means for adjusting the position of said pair of elements in spaced relation to said glue applying roller.

16. In a glue applying machine, the combination of means for a source of glue, a glue applying roller adjacent said means for applying glue to a sheet fed thereto, a roller positioned in contact with said source and in operative contact with said glue applying roller for supplying glue thereto, means for varying the relative position of said glue applying roller and said glue supplying roller to control the supply of glue to said glue applying

roller, an electrical circuit including means for controlling the operation of said last mentioned means, a pair of switch elements connected in said circuit and positioned for engagement by the sheet to which the glue is being applied for controlling said circuit, and means for adjusting the position of said switch elements in spaced relation to said glue applying roller.

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