March 27, 1951 E. W. QUACKENBUSH 2,546,522

ADHESIVE APPLYING MACHINE

Filed Nov. 12, 1947 2 Sheets-Sheet 1

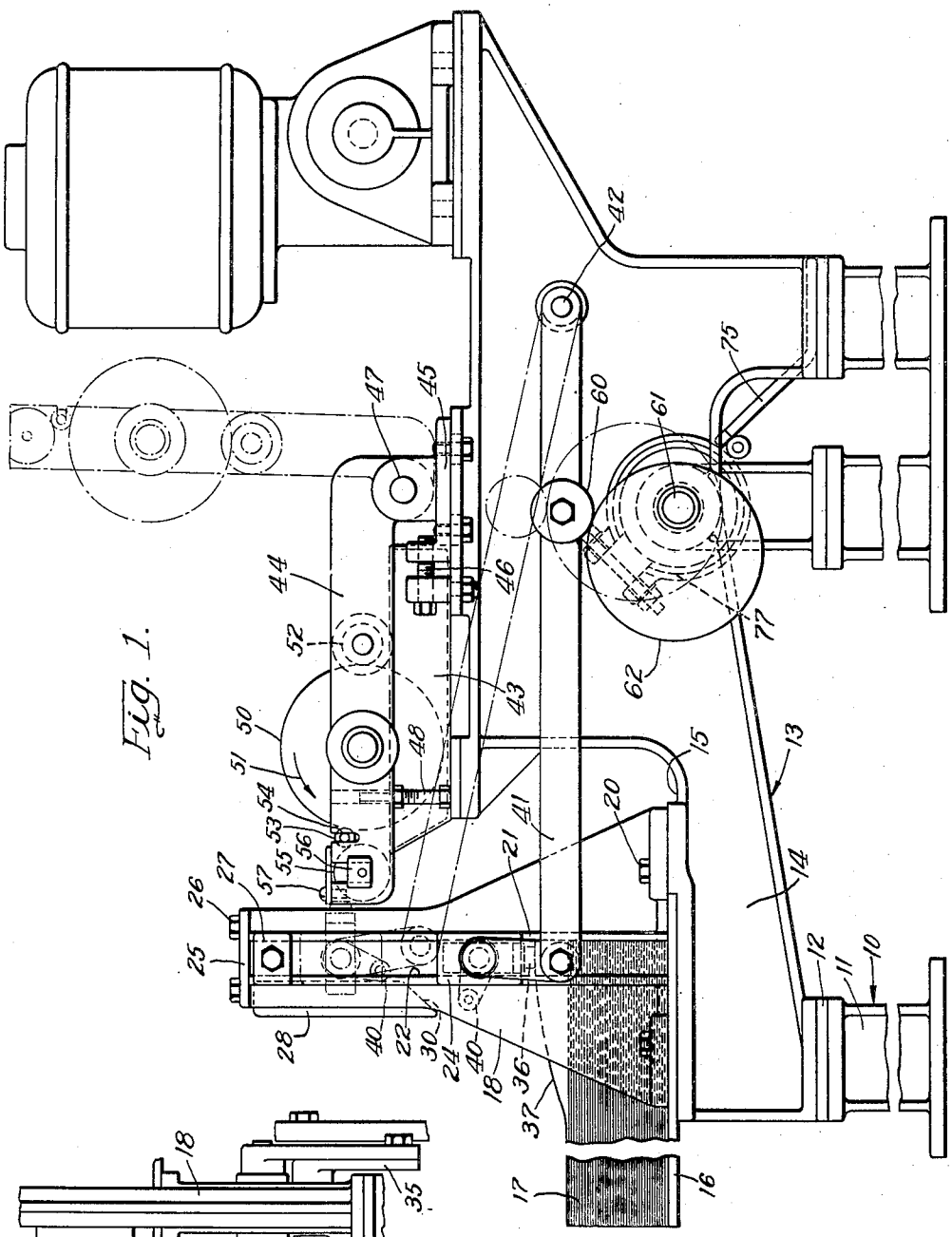


Fig. 1.

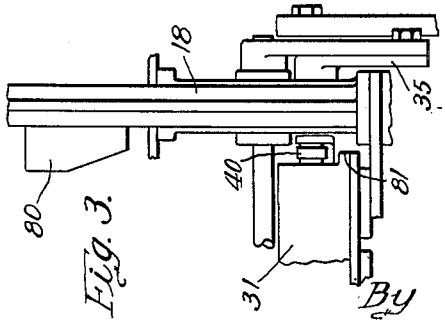


Fig. 3.

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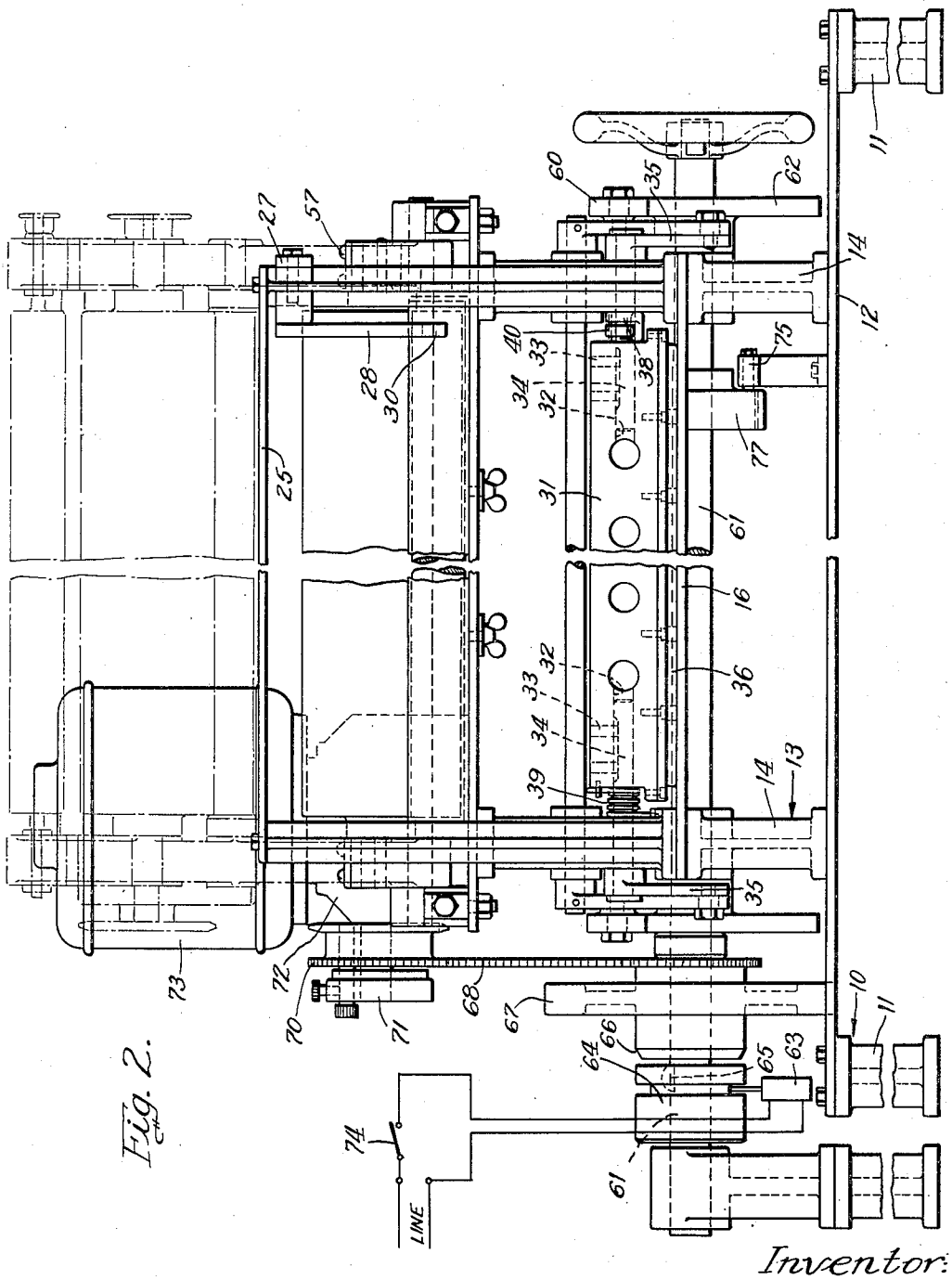


Fig. 2.

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ADHESIVE APPLYING MACHINE

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Application November 12, 1947, Serial No. 785,418

6 Claims. (Cl. 91—47)

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The present invention relates generally to wrapping machines and more particularly to an apparatus for applying an adhesive film to a portion of the surface of a sheet of paper to be used in the wrapping of an article.

Heretofore difficulty has been experienced in wrapping packages for transportation when an adhesive was used on the wrapper itself. Either a wet or wetted adhesive dries while an article is being wrapped and for that reason cannot be fully utilized, and a quick wetting of a dry adhesive entails an extra operation for that purpose and a further delay to hold the wrapper in place until the adhesive dries sufficiently to hold the wrapper in place against loosening while handling.

In the present invention a fast drying wet adhesive is applied long enough ahead of its use to establish a good bond with the wrapper and until used is kept from drying by being protected against contact with the atmosphere. By preventing the adhesive from drying, it is always kept in condition for ready use at any time; and once the wrapper is in place, closure can be made quickly without any loss of adhesive effect, the resultant package being ready for immediate handling.

A further object of the invention is to provide a machine which applies an adhesive along one edge of the top sheet of a stack of wrappers and separates the treated sheet from the rest for feed purposes or for ready access by hand.

A further object is to provide an apparatus which may be readily adapted to supply single pieces of wrapping paper coated with adhesive to conventional wrapping machines.

Another feature of the invention resides in the application of adhesive to the top sheet of a stack of wrappers, separating the top sheet from the others and keeping the adhesive wet until used, in what is virtually a single operation.

The invention is further characterized by a construction and arrangement of elements which is simple in its organization and operation; easy to manufacture, use and clean; and inexpensive to build, service and repair. These being among the objects of the invention, other and further objects will become apparent from the drawings, the description relating thereto, and the appended claims.

Referring now to the drawings,

Fig. 1 is a side elevation of an apparatus embodying the preferred form of the invention.

Fig. 2 is a front elevation of the apparatus shown in Fig. 1.

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Fig. 3 is a modification of the apparatus shown in Figs. 1 and 2 by which a sheet is displaced in three directions for handling when adhesive is applied to it.

In the performance of the invention, liquid adhesive is picked up from a supply container by a suppy roll and applied to the edge of the top sheet of a stack of wrappers. A movable applicator conveys the adhesive from the roll to the sheet. The top sheet adheres to the applicator and as the applicator is raised the top sheet is displaced to separate it from other sheets. The contact between the applicator and the sheet transfers the adhesive to the sheet, giving the adhesive enough time to form a good bond. The continued contact between the applicator and the top sheet, with the top sheet in its ready-to-use position, prevents atmospheric contact with the film of adhesive until the sheet is positively pulled from the applicator. Once the sheet is pulled from the applicator, the upper surface of the adhesive film is fresh and wet for strong adhesion when the wrapper is placed around an article.

By way of example and in connection with a calender winding machine such as that shown in my copending application Serial No. 628,155, now Patent No. 2,521,253, reference to which is hereby made, a sub-frame 10 is provided comprising vertical legs 11 and a table top 12 bolted thereto to form a table or bench-like structure upon which the adhesive applicator 13 embodying the invention may be mounted along with the calender winding machine shown in my copending application.

The adhesive applying apparatus 13 comprises two side frame members 14 offset as at 15 to receive a plate 16 which serves as a bed for a stack of wrappers 17. A bed which may be raised or lowered as desired may be employed, but in the embodiment shown the bed 16 is mounted rigidly in place. At each side of the bed 16 a pair of uprights 18 are secured by bolts 20 in spaced relationship with their adjacent edges provided with parallel tracks 21 defining an open slideway 22. Grooved blocks 24 are mounted for vertical movement in the slideways 22 as received in place through the top thereof which is closed by a cap 25. This cap, which is secured by bolts 26, also secures the vertical members rigidly with respect to each other. After the block 24 in one of the slideways 22 is in place, a stationary element 27 is bolted in place which carries a vertical member 28 disposed at one side of the slideway 22 and provided with a cam 30 on the bottom face thereof.

The blocks 24 support a crossbar 31 bored at opposite ends, as indicated at 32, to receive shafts 34 therein to which the bar 31 is keyed by setscrews 33. The outer ends of the shafts 34 are journaled in the blocks 24 and extend beyond the blocks 24 at opposite ends to receive the links 35. The bar 31 is shown in the resting position in Figs. 1 and 2. The lower edge of the bar 31 is provided with resilient pads 36 whose bottom surfaces are adapted to engage the edge of the top sheet 37 on the stack 17 and rest thereupon at the lowermost limit of movement of the blocks 24.

One end of the bar 31 is provided with an outrigger element 38 (Fig. 2) carrying a follower 40 which engages the cam 30 on the lower end of the member 28 when the bar 31 is moved toward its upper limit.

The lower end of the links 35 as shown in Fig. 1 are bolted to one end of a lever element 41 pivotally mounted to the side frame as at 42. Two levers 41 are provided, one on the outside of each of the side frames, to maintain the bar 31 on the level. Whenever the levers 41 are raised, the bar 31 is pushed upwardly through the links 35, and, as the follower 40 engages the cam 30, the bar 31 is rotated through a 90° angle to dispose the pads 36 towards the right of the machine as viewed in Fig. 1.

At this upper limit of the bar's movement the pads 31 pick up adhesive from an apparatus which has a glue pan indicated at 43 and two horizontally spaced roller supporting arms 44 which are pivotally mounted as at 47 upon blocks 45 which can be adjusted in a horizontal direction by means of an adjustment screw 46. The arms 44 are provided with a height adjusting screw 48 and carry a large adhesive pickup roller 50 which is rotated in the direction of the arrow 51 to pick up adhesive from the pan 43. The roller 52 is adjusted to distribute the adhesive in a thin film of predetermined thickness upon the surface of the roller 50. This film is then transferred by the lag roller 53, which is mounted for loose vertical movement in grooves 54, towards the front of the machine to the discharge or feed roller 55 which is journaled in blocks 56 and held in place by a cap 57. It is with the feed roller 55 that the glue pads 36 come into contact to pick up a thin sheet of glue.

Then, when the levers 41 are lowered, the follower 40 relinquishes contact with the cam 30, and, under the influence of a torsion spring 39, the bar 31 is turned to its vertical position with the glue pads directed downwardly where they come into contact with the top sheet 37 as already mentioned to transfer the glue thereto.

For the purpose of raising and lowering the levers 41 each is provided with a follower 60. An intermittently driven drive shaft 61 is journaled in the side frames 14 and carries a pair of eccentric wheels 62 to serve as cams for the followers 60. Referring to Fig. 2, the intermittent drive of the shaft 61 is accomplished through a solenoid 63 which actuates a clutch element 64 keyed as at 65 to the shaft 61. The other clutch element 66 is located upon a flywheel 67 journaled on the shaft 61 and is driven by a sprocket chain 68 from a sprocket wheel 70 in turn driven from a power shaft 71. This shaft is a power take-off shaft of a speed reduction device 72 connected to a motor 73.

The electrical circuit for the solenoid 63 is shown in which a normally open switch 74 is connected in series with the solenoid 63 to control

its operation. The solenoid 63 closes the clutch 64 when it is energized. The switch 74 is preferably a foot treadle switch normally located beneath the table 10. Whenever the clutch 64, which is the conventional one revolution type, is thrown into engaged position by the action of the solenoid 63 it remains engaged until a complete revolution of the shaft 61 has been accomplished, whereupon the treadle switch 74 being released and the solenoid 63 deenergized the clutch is automatically disengaged. Thus each time the treadle switch 74 is closed the apparatus runs through one complete cycle.

Rotation of the shaft 61 is prevented, except when the clutch 64 is engaged, by a friction brake 77 which surrounds the shaft 61. This brake is secured against rotation by an element 75 to which it is attached.

The motor 73 runs continuously driving the flywheel 67 and also the adhesive pickup roller 50 at a constant slow speed. The apparatus described is preferably located in back of the calender winding machine described in my copending application and whenever a calender is to be wrapped the operator closes the switch 74 to actuate the clutch 66. When the operator is through winding the calender the apparatus described herein has completed its cycle and the sheet is drawn away from contact with the adhesive pads and the wrapper applied to the calender immediately.

By way of explaining the operation of the cycle of the apparatus described, the moving elements are so adjusted and arranged that the glue pads 36 rise, rotate to receive the glue from the glue roller 55, and then are brought down to engage the top of the upper sheet 31, after which they are raised slightly to the position shown in Fig. 1, whereby the sheet 31 is separated from the stack and held ready for use. This completes the cycle, and the clutch 64 disengages itself.

Referring to Fig. 3, an embodiment is shown wherein the torsion spring 39 effects lateral movement of the bar 31 in the resting position shown in Fig. 1. This lateral movement of the bar is accomplished as the pads move upwardly to their resting position so that a cocking action is established against the sheet 37 to slide it slightly sidewise so that it can be gripped by the fingers at one side of the stack when it comes time to slip it into calender wrapping position. The sidewise motion is accomplished by a second cam 80 bearing against the surface 81 on the end of the bar 31 forcing it endwise to compress the torsion spring 39 slightly. In Fig. 3 the cam 28 has been removed to better show the cam 80 which is attached to the back side of the upright 18.

In those instances where the wrappers 17 have been cut without riffling before being placed upon the bed 16, a small roller can be located between the bed 16 and the bottom sheet so that it causes a hump in the stack 17 which tends to riffle the wrappers and assist the separation of the uppermost sheet 37 when it is contacted by the glue pads and lifted.

Furthermore, wherever the sheets have a tendency to cling together, whether it be due to cutting with a dull knife or static elasticity, a second cam and follower can be provided to rotate the bar 31 to carry the pads rearwardly and develop a pull upon the top sheet 37 either at or prior to the time that the sheet 37 is raised.

From the description it will be readily apparent how the objects of the invention are accom-

plished, particularly the operation by which the adhesive is preserved against drying until the wrapper is ready for use. Intimate contact between the adhesive pads 36 and the sheet prevents atmospheric contact which would dry the adhesive and when the sheet 37 is pulled through either by hand or an automatic feeder, the upper surface thereof is fresh and wet for quick adhesion. Consequently, a quick drying glue can be used in the device with improved results and the moment that the wrapper is wrapped around and the adhesive treated edge is pressed down, the wrapper is ready for handling.

Consequently, although certain embodiments of the invention have been shown and described herein it will be readily apparent to those skilled in the art that various and further modifications and changes can be made without departing from the spirit of the invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. An apparatus for applying an adhesive film to a sheet comprising a stationary bed for supporting a stack of sheets, said bed having its surface unobstructed whereby sheets may be readily lifted away from the bed, a pair of vertical slideways over said bed, a linearly movable element riding in said slideways having a pad on its lower surface for transferring adhesive to the top sheet of the stack, means for applying adhesive to said pad, a power drive, a pivoted arm attached to the movable element at one end for reciprocating same, a rotatable cam for lifting the arm during a portion of a revolution, said pad resting on the uppermost sheet of the stack during another portion of a revolution to transfer adhesive thereto, and clutch means for selectively connecting the power drive to the rotatable cam to cycle the apparatus.

2. An apparatus for applying an adhesive film to a sheet comprising a fixed bed for supporting a stack of sheets, a pair of vertical slideways over said bed, a linearly movable element riding in said slideways having a pad on its lower surface for transferring adhesive to the top sheet of the stack, means for applying adhesive to said pad, a pivoted arm attached to the movable element at one end for reciprocating same, and a rotating cam for lifting the arm during a portion of a revolution, said pad resting on the uppermost sheet of the stack during another portion of a revolution to transfer adhesive thereto.

3. In an apparatus for applying a liquid adhesive to a sheet the combination including a vertically reciprocable transfer element having an adhesive transfer surface on the bottom thereof, means for applying adhesive to said surface, a bed for supporting a stack of sheets, means for raising the transfer element above the bed including an eccentric wheel, a power drive for driving said wheel, and a one revolution clutch for connecting the wheel to the power drive, and a brake for said eccentric wheels, said brake being so located as to stop the transfer element between cycles a distance above the top of the bed.

4. In an apparatus for applying a liquid adhesive to a sheet and for separating a single sheet from a stack thereof, the combination including a reciprocable transfer element having an adhesive transfer surface, means for applying adhesive to said surface, a bed for supporting a stack of sheets, means for moving the transfer element away from the bed including an eccentric wheel, a power drive for driving said wheel, and a one revolution clutch for connecting the wheel to the power drive, and brake means so located with respect to the wheel as to stop the transfer element between cycles a distance away from the top of the bed, the adhesive on the surface adhering to the top sheet in the stack to separate it therefrom.

5. An apparatus for applying a liquid adhesive film to a sheet comprising a rotating roller having a thin film of adhesive thereon, a movable transfer element having a resilient pad for carrying adhesive, a pair of slideways for said element extending downwardly from said roller, bearing means for rotatably supporting the ends of the transfer element in each of said slideways, said bearing means being reciprocable in the slideways, drive means for lifting said transfer element to the top of said slideways, a support for a stack of sheets at the bottom of said slideways, means at the top of the slideways for rotating the transfer element to bring the resilient pad into contact with the roller, a one revolution clutch for intermittantly supplying power to said drive means, manually actuated means for engaging said clutch when it is desired to gum a sheet, and brake means for stopping said drive means when the clutch is disengaged, said brake means being so located as to check motion of said drive means in such position that said transfer element comes to rest at a point spaced above the top of the stack of sheets.

6. In a device of the class described, an adhesive supplying roller, a vertically reciprocable transfer element, guide means for movably supporting said element below said roller, means for reciprocating said element including a lever fixed to said transfer element at one point and a rotary cam for lifting said lever, means for checking rotation of said cam at a point at which said lever is slightly raised from its lowermost position, a clutch for intermittently connecting said cam to a source of power, means for engaging and disengaging said clutch when said lever is in the slightly raised position, and a support for a stack of sheets, said support being so located that the top sheet of the stack is below the resting position of said lever but above the lowermost position of the lever.

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The following references are of record in the file of this patent:

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