July 10, 1951 L. N. WARREN 2,559,908

HEATED TAKE-OFF BLADE OR PICK FOR GLUERS

Filed Jan. 24, 1950 2 Sheets-Sheet 1

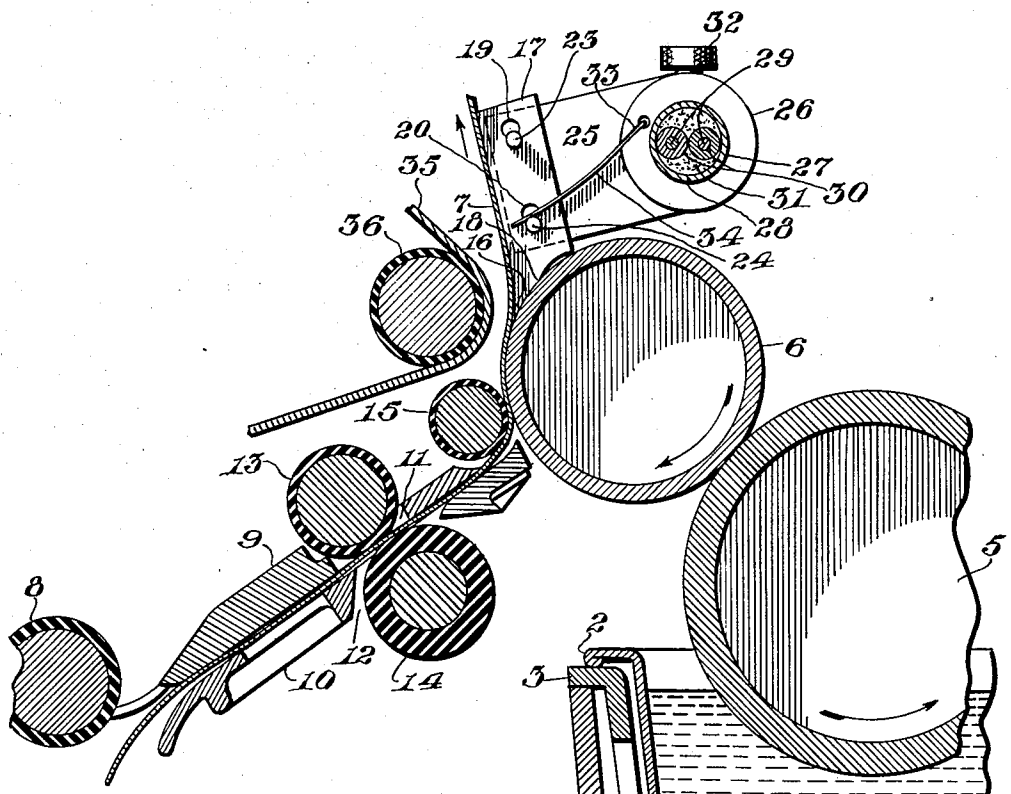


Fig. 1.

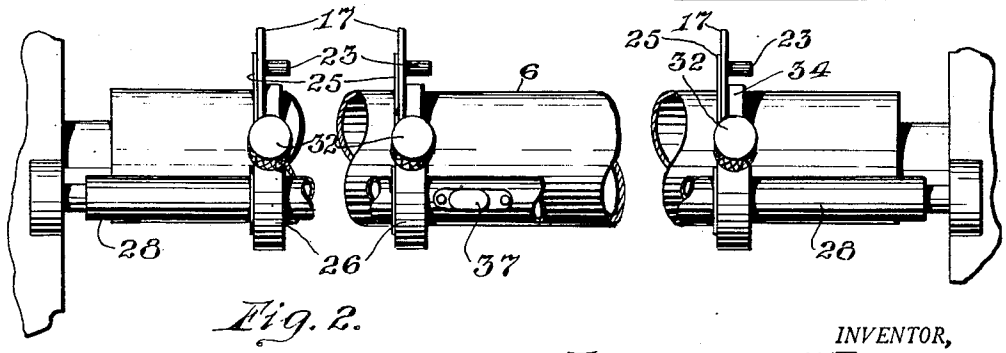


Fig. 2.

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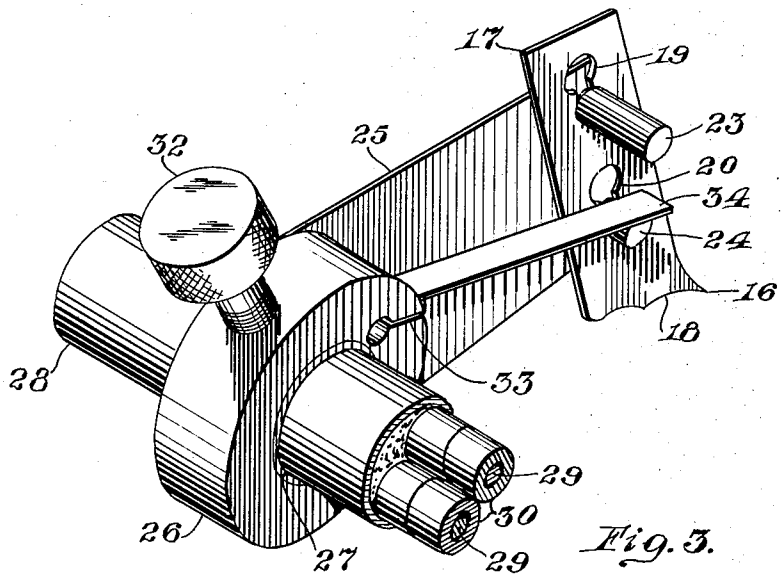


Fig. 3.

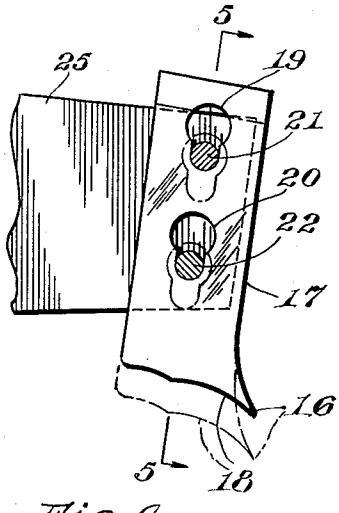


Fig. 4.

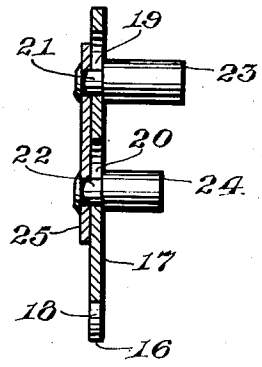


Fig. 5.

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HEATED TAKE-OFF BLADE OR PICK FOR GLUERS

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7 Claims. (Cl. 91—58)

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The object of the invention is to provide improvements in gluing machines, generally known as gluers, such as are used in the coating of sheets or webs of paper and the like with adhesive, as for example prior to such sheet or web being applied as an ornamental or protective covering for a paper or cardboard box blank, before such blank is folded and secured in final form, usually as the top or bottom section or member of a two-piece box. However, the invention is in no sense limited to such use, as the sheet or web may be adhesively coated for use in many other ways. Furthermore, throughout the following specification and claims the single term web will be used to denote either a precut sheet or a web of relatively unlimited length.

This type of machine is primarily characterized by a gluing roll that carries a film of glue of only one or possibly two or three-thousandths of an inch in thickness upon its outer cylindrical surface, means to apply the glue film thereto, means to guide a web of paper or the like towards and into contact with said roll, and usually a plurality of transversely narrow, sharpened blades or picks that function to separate said web from said roll. Being between and in contact with both the glue-carrying roll and the glue-receiving web, the sharpened, blade-like ends of these so-called picks of existing machines in time accumulate sufficient glue to impair their operation, the glue drying or coagulating and breaking off in small lumps that cause uneven "pimples" in the final coated box member, or cause ridges as the film of glue on the roll is parted by the edge of the pick and at times fails to again flow together as it should, or may tear the paper and generally cause trouble, that results in frequent shutdowns of the machine merely for cleaning the picks.

Another and more specific object, therefore, is to provide a heated support for said picks, in order that the heat therefrom will be conducted to each of the several picks and to their respective sharpened terminal edge portions, so that the glue in contact with said picks will at all times be maintained in liquid condition, thereby insuring the maintenance of an even film upon the roll, no accumulation of otherwise chilled and hardened glue particles upon the picks, and in general to eliminate all need for shutdowns and cleaning, except when the entire machine is to be so treated, while in general increasing the efficiency and output of a given gluing machine.

A further object is to provide in such a device the combination of a glue-carrying roll, an electrically heated rod, bar or tube preferably with a

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thermostatic control, an arm adjustably carried by said rod, bar or tube, a sharpened pick or detachable pick plate normally bearing against said roll and composed of a metal of relatively high heat conductivity such as copper, means to detachably secure said pick or pick plate to said arm, and means to yieldingly maintain said pick or pick plate in engagement with said roll.

With the objects thus briefly stated, the invention comprises further details of construction and operation, which are hereinafter fully brought out in the following specification, when read in conjunction with the accompanying drawings, in which Fig. 1 is a vertical transverse section through that portion of a well known type of gluing machine or gluer that includes the gluing roll, the picks or pick plates, their heated support and adjacent paper guiding elements; Fig. 2 is a top plan view of the same; Fig. 3 is a perspective view showing the pick supporting mechanism and a pick operatively carried by the latter; Fig. 4 is a side elevation of a pick and its immediate support; and Fig. 5 is a section on the line 5—5 of Fig. 4.

Referring to the drawings, one embodiment of the invention is shown in detail, as hereinafter described in combination with the immediately adjacent elements of a gluing machine or gluer.

The gluing machine comprises a glue pan 1 having a peripheral flange 2, which latter rests upon the corresponding peripheral portion 3 of any suitable form of water pot 4, which normally contains hot water of the proper temperature to maintain the glue in the glue pot at the proper degree of flow or viscosity. Rotatably mounted in any suitable manner with the lower portion of its cylindrical surface extending into and beneath the surface level of the glue in said pot is a glue drum 5, the outer surface of which picks up a film of liquid glue and conveys it to the surface of a distributor roll 6, which is set in such slightly spaced relation with respect to said drum as to regulate the thickness of the film of glue that is picked up by said roll, and which film is thereupon conducted to and in substantial part deposited upon the adjacent surface of a paper web 7. The thickness of the film taken up by the distributor roll is obviously very thin and of the order of but one or two thousandths of an inch in thickness.

For the purpose of this disclosure, the paper web is first seen as passing beneath a rubber-covered front feed roll 8, and thence between spaced upper and lower guide plates 9 and 10, the diagonally upward continuity of which is interrupt-

ed by apertures 11 and 12, respectively, through which cooperating rubber-covered feed rolls 13 and 14 contact, the former being an idler roll which operates to press the web against the latter which is a positive feed roll. From this point the web passes beneath a guide roll 15 which presses said web against the film-covered surface of the distributor roll 6, which thereafter by adhesion between the glue film and web carries the latter around and in continuing contact with said last-mentioned roll, until it is removed therefrom by the sharpened toe portions 16 of a plurality of pick plates 17.

Each of these pick plates or picks is made of copper or other metal having a characteristically high degree of heat conductivity, and, while being sufficiently thick to rigidly maintain its flat shape, is at the same time as thin as possible in order to interrupt and part the otherwise even and transversely continuous film of glue upon the surface of the distributor roll. The under edge portion of each pick is furthermore provided with a concavely curved surface 18, that conforms to the surface of said distributor roll in order that the friction caused by the pressure of the pick against said roll will be distributed over a maximum area. Also, each of said picks is provided with preferably two keyhole apertures 19 and 20, the narrower lower portions of which normally receive and engage the opposite sides of the tranversely restricted neck portions 21 and 22 of upper and lower studs 23 and 24, that are secured to and extend in substantially vertically spaced relation laterally from one side of the free end portion of a pick arm 25.

Each pick arm 25 is carried by and extends radially from a hub 26, that is provided with a central bore 27, through which extends a metallic tube 28 conducting one or more resistance heating wires 29, surrounded by refractory beads 30 or other convenient form of insulating material, by which said wires are separated from each other and from the surrounding tube, while if desired the remainder of the air space within said tube may, but need not be, filled with any suitable form of heat-conducting granules 31. Each of said hubs is adjustably secured angularly with respect to and longitudinally of said tube by means of a set screw 32, while secured to said hub in any suitable manner at 33 and extending either radially or diagonally outwardly therefrom is a leaf spring 34, the outer free end of which presses downwardly upon the lower and shorter stud 24, in order to thereby maintain the sharpened toe of said pick plate in light but firm and uninterrupted contact with the surface of said distributor roll. The upper of said studs 23 is preferably longer than the lower stud, and serves as a means for manually lifting the pick arm, and thereby the pick from engagement with said roll, whenever it may become necessary or at least desirable to renew or replace said pick, or to sharpen, clean or otherwise treat the same.

The pick plates herein described thus function to remove the web from the surface of the distributor roll, and having performed this operation it is inconsequential whether said web follows the forwardly sloping edge of said pick plate for its entire length (as shown in Fig. 1), or is removed therefrom by any suitable means (not shown) and thereby led towards a neighboring conveyor belt 35 that passes over an idler roll 36, and delivers the web to a predetermined position, where it is usually cut and directly applied to the surface of a box blank (not shown), while the glue

film upon its surface is still in moist or tacky and readily adhesive condition. The distributor roll, having imparted glue to the web, continues to revolve and upon again contacting said glue drum takes up a further quantity of glue in the form of the thin film herebefore described.

On the operation of this device, as the glue drum and the distributor roll continue to revolve, and the web continues to move past and in temporary surface contact with the latter, said web is separated from the distributor roll by the sharpened toe of the pick plate. It will be obvious that during prolonged operation of the gluer there has heretofore been an unavoidable tendency of the glue to collect at least upon the opposite sides of the toe portion of said pick plate, and as the pick has until now been unheated the glue thus collecting has congealed or dried and in time built up to the point where the effective width of the toe of the pick has been increased, the coagulation of glue has tended to break off in lumps that cling to the under or glued surface of the web, and interfere with the otherwise smooth application of the same to a box member or other object, and the desired uninterrupted smooth transverse continuity of the glue film has been broken.

By contrast, heating the pick plate preferably by a regulatable means, readily maintains the temperature of the same at whatever degree of heat is necessary to insure fluidity of the glue, so that no drying glue tends to coagulate upon the pick point, the effective thickness of the same is maintained at its initial predetermined width, and the glue film is interrupted transversely only for the predetermined width of said pick, and accordingly the evenness of the film is regained almost immediately upon a given pick-contacting area of the distributor roll passing the heel of the pick, so that the gluer can run for hours and days without having to be shut down for cleaning the picks.

It will be also noted that each pick plate is removable and replaceable upon its supporting pick arm, independently of any and all other such plates, while the springs 34 maintain the points in steady and unvarying contact with the film-carrying surface of the distributor roll, and any minute radial unevenness in the circumferential continuity of such surface is taken care of by the ability of the pick plate to rise and fall with respect to the studs 23 and 24 as guides. Furthermore under the light tension of the springs 34, the angular position of each pick arm about the tube 28, being independently adjustable, is fixed in the desired adjusted position by means of the set screw 32.

The current passing through the resistance wires 29 and the heat resulting therefrom is preferably controlled by an adjustable thermostat 37 mounted directly upon the tube 28, in order to thereby maintain the temperature of the pick plate in general and its sharpened toe in particular preferably at the same or slightly higher degree than that of the glue film upon the distributing roll.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:

1. In a gluing machine, the combination of a rotatable glue distributor roll, a heated support, a pick arm carried by said support, and a pick plate detachably carried by said arm and in sliding engagement with said roll.

2. In a gluing machine, the combination of a

rotatable glue distributor roll, a heated support extending substantially parallel with and in spaced relation with respect to said roll, a plurality of pick arms independently adjustable upon said support, and a pick plate detachably carried by each of said arms and in sliding engagement with the outer exposed surface of said roll.

3. In a gluing machine, the combination of a rotatable glue distributor roll, a tubular support, an electric heating element extending through said tube, a pick arm carried by said support, and a pick plate detachably carried by said arm and having a sharpened toe in sliding engagement with the surface of said roll.

4. In a gluing machine, the combination of a rotatable glue distributor roll, a tubular support, an electric heating element extending through said tube, a pick arm, a pick plate detachably carried by said arm and having a sharpened toe in sliding engagement with the surface of said roll, and adjustable means to alter the position of said arm upon said support both angularly and longitudinally.

5. In a gluing machine, the combination of a rotatable glue distributor roll, a tubular support, an electric heating element extending through said tube, a pick arm, a pick plate detachably and slidably carried by said arm and having a sharpened toe in sliding engagement with the surface of said roll, adjustable means to alter the position of said arm upon said support both angularly and longitudinally, and resilient means to permit a predetermined degree of relative movement between said arm and said plate as said roll revolves.

6. In a gluing machine, the combination of a rotatable glue distributor roll, a tubular support extending parallel with and in spaced relation with respect to said roll, an electric heating element extending through said tube, a pick arm having a pair of lugs having narrowed portions adjacent to the surface of said arm, a pick plate having a pair of keyhole apertures adapted to receive the free outer end portions of said lugs, and the smaller portions of said apertures normally engaging the narrowed portions of said lugs, adjustable means to alter the position of said arm upon said support both angularly and longitudinally, and a leaf spring secured at one end to said arm and having its free end in engagement with one of said lugs to yieldingly maintain the toe of said plate in sliding engagement with the surface of said roll.

7. In a gluing machine, the combination of a rotatable glue distributor roll, a support, a pick arm carried by said support, a pick plate carried by said arm and cooperating with said roll, and means for heating said arm and said pick.

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