

July 2, 1957

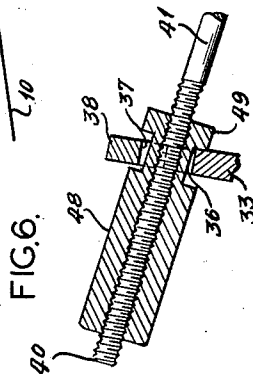
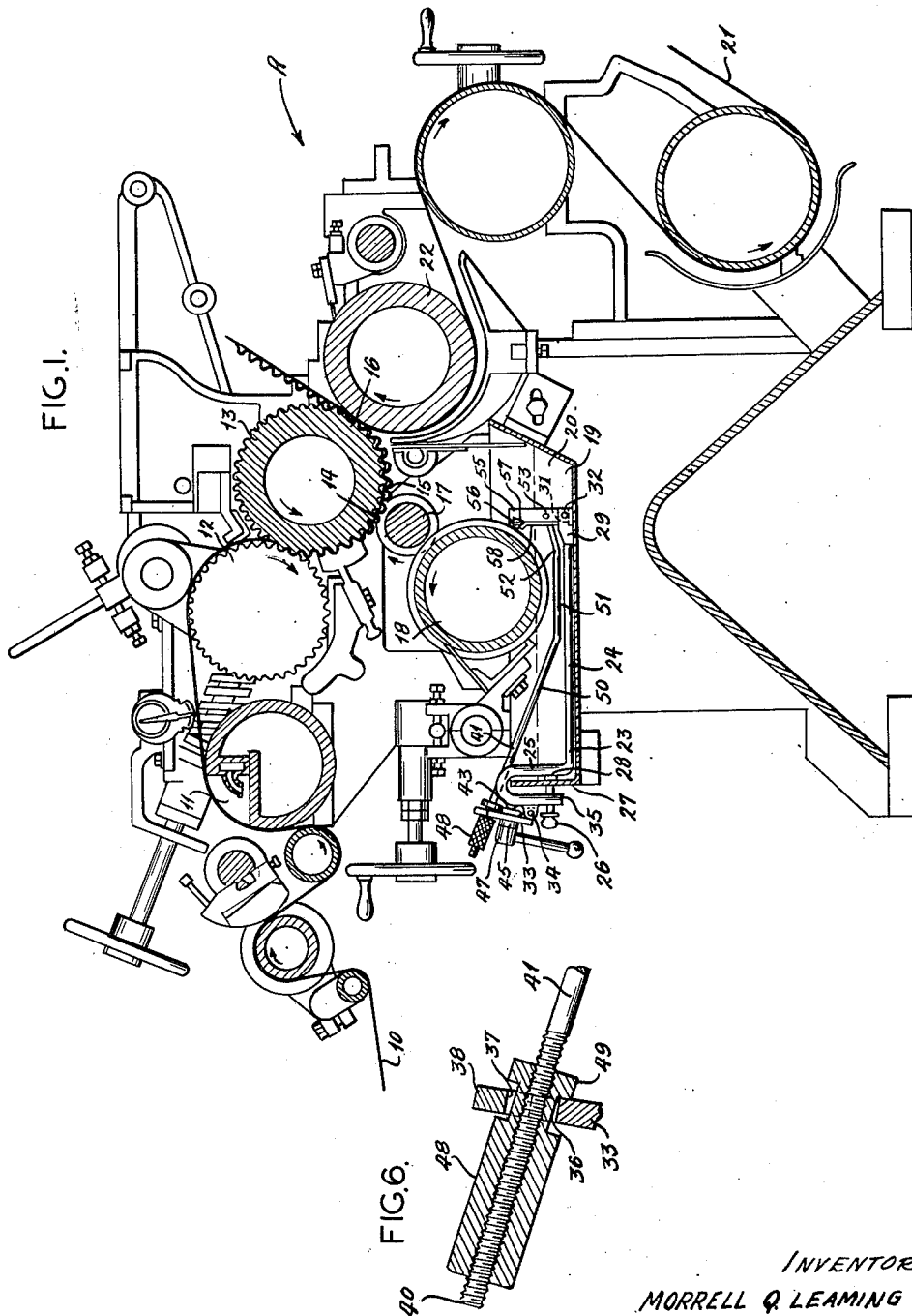
M. Q. LEAMING

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COATING ROLLER DOCTORING MEANS

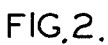
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FIG. 4.

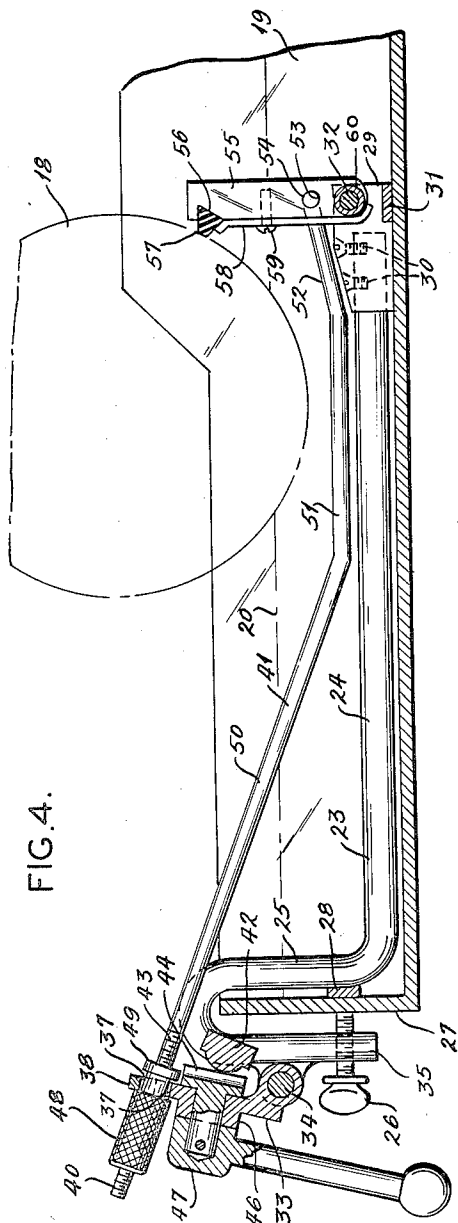
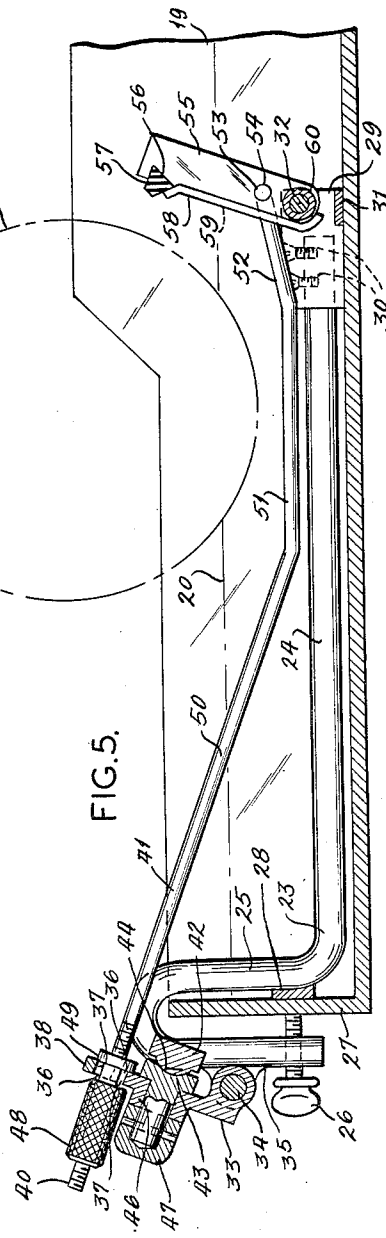


FIG. 5.



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COATING ROLLER DOCTORING MEANS

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8 Claims. (Cl. 118—262)

This invention appertains to an improvement in machines for corrugating and fabricating fibreboard and the like, and, more particularly, to an improved, adjustable glue roll wiper for a paperboard corrugating machine.

Corrugated fibreboard for shipping containers and other packing purposes is fabricated by corrugating machines. These machines deform flat sheets of corrugating medium into regularly curving folds known in the trade as corrugations. Adhesive material is applied by means of a glue transfer roll to the tips of the corrugations and the medium is then pressed and secured against a flat sheet of liner material to form what is known as "single-face" corrugated board.

Since a great variety of widths of packaging materials are required in the course of ordinary business operations, it is often desirable to make single-face material of substantially varying widths on the same machine. One of the most difficult problems which occurs when varying widths of material are run on a single machine is that of controlling the width of the glue application to coincide with the width of the corrugating medium. It is highly desirable that the glue application band on the transfer roll be substantially equal to the width of the corrugating medium. It is obvious that if the width of the glue band on the transfer roll is wider than the width of the corrugating medium, the adhesive will tend to spatter onto the corrugating roll and coagulate, thereby causing serious operating difficulties. In such cases, as the adhesive builds up to a substantial thickness on the corrugator roll, it is necessary to not only stop the machine for cleaning, but it is necessary to manipulate various machine parts to compensate for the thickness of the excess adhesive.

Many previous devices have been employed to wipe the glue transfer roll in an effort to control the width of the glue band thereon. However, attempts to directly control the width of the glue band on the transfer roll have been generally unsuccessful in commercial practice. This is because the most efficient types of transfer rolls employ relatively small slits or slots in the surface thereof to maintain adhesive thereon. If a relatively wide band of adhesive material is applied to the transfer roll, and then wiped off by wipers acting directly on the surface of the transfer roll, it is impossible to remove the adhesive which collects in the aforementioned surface indentations. The adhesive in the indentations accumulates and eventually thickens and coagulates just as if no control means were employed. Therefore, it is highly desirable to provide an accurate means for controlling the width of the band of adhesive before it is applied to the transfer roll.

In the ordinary single-facer corrugating machine, it is customary to pick up the glue from a pan reservoir by means of a relatively large glue roll which rotates in peripheral contact with the transfer roll. It is therefore an object of this invention to provide a flexible, continuous wiping means to control the width of the adhesive

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band on the glue pick-up roll and thereby control the width of the glue band as it is applied to the transfer roll.

A further object of this invention is to provide a wiper for a glue pick-up roll which may be accurately adjusted by means of controls which are plainly visible from the operator's station of the corrugating machine.

A still further object is to provide a glue roll wiper having a continuous wiping surface, any portions of which may be moved away from the face of the glue roll to thereby accurately vary the width of the glue band.

Another object is to provide a continuous wiping means having adjustable control arms pivotally connected to a rigid frame to permit accurate adjustment of the parts.

Other objects and advantages of this invention will be apparent to those skilled in the art upon a full and complete understanding of the construction and operation of this device.

The invention also consists in the parts, arrangements and combinations of parts hereinafter described and claimed.

The accompanying drawings form a part of this specification and like numerals and symbols therein appearing refer to like parts wherever they occur.

Fig. 1 is a vertical, sectional view of a single facer corrugating machine in which the glue roll wiper of the invention is shown in place;

Fig. 2 is an enlarged vertical, fragmentary, sectional view of the glue roll wiper of this invention shown in position within a glue reservoir of a single-facer corrugating machine;

Fig. 3 is an enlarged fragmentary, plan view of a glue wiper device embodying this invention;

Fig. 4 is a vertical, sectional view along lines 4—4 of Fig. 3 showing the wiper parts in contact with the glue pick-up roll;

Fig. 5 is a vertical view along a similar section as shown along lines 4—4 of Fig. 3 shown with the entire wiping surface released from the glue pick-up roll; and

Fig. 6 is an enlarged, fragmentary, sectional view of a control or adjusting means for this invention.

A typical embodiment of a single-facer corrugating machine A is illustrated in Fig. 1. In the machine shown, the corrugating medium 10 enters the left side of the machine under various tensioning rolls and passes over a steamer 11 which applies moist heat to the medium thereby making it relatively soft and pliable. The corrugating medium then moves onward to a corrugator backing roll 12 which has regular projections meshing into similar projections on the rotating corrugator roll 13. The pliable medium is deformed between the meshing projections of the corrugator backing roll 12 and the corrugator roll 13 and is thereby formed into the shape illustrated in Fig. 1. The centrifugal force of the rotating corrugator roll 13 causes the medium to tend to move outwardly from the corrugator roll projections as shown at 14. The radial distance which the corrugating medium 10 is permitted to move outward from the corrugating roll 13 is controlled by means of circular, adjustable stripper knives or fingers 15.

The stripper knives 15 guide the medium back into contacting relation with the projections of the corrugator roll 13, at a point designated by the numeral 16. Glue or adhesive is applied to the tips of the corrugations, usually at a point 14 where the medium 10 is disposed the farthest away from the corrugating roll 13. The ordinary means for applying the adhesive to the tips of the corrugating medium is by a glue transfer roll 17, which rotates in contacting relation with a glue roll 18 which rotates within a glue pan reservoir 19. A fluid adhesive mixture 20 is maintained within the glue pan or reservoir 19 so that the lower portion of the glue roll 18 is, at all times, in contact with the glue.

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After the tips of the corrugating medium 10 have received an application of glue, the medium is advanced to a point 16 where a liner sheet 21 is moved into contacting relation therewith by means of a rotating pressure roll 22, thereby forming what is known in the trade as "single-face" corrugated material.

In present single-facer corrugating machines, the corrugating medium 10 is permitted to move outwardly as at point 14 so that the adhesive on the glue transfer roll 17 does not come in contact with the exposed faces of the corrugator roll 13 adjacent the side edges of the corrugating medium thereon. Of course, if excess adhesive coagulates and builds up on the glue transfer roll 17, it is necessary to adjust the stripper knives 15 outwardly so that the corrugating medium falls still farther outwardly from the corrugating roll 13. The farther the corrugating medium 10 is moved away from the corrugating roll 13, at point 14, the more difficult and uncertain is the glue application with the attendant possibility that the quality of the single-face material produced will be unsatisfactory. Therefore, it is very important that the corrugating medium follow, at all points, as close to the corrugating roll 13 as possible. In order to permit the medium 10 to be disposed closely adjacent to the corrugating roll 13, it is imperative that the glue or adhesive band on the transfer roll 17 be closely controlled so that marginal portions thereof do not extend beyond the marginal portions of the medium or they will coagulate, thicken and build up on the transfer roll into contacting relation with the exposed portions of the corrugator roll 13 beyond the side edges of the corrugating medium. It is, therefore, highly desirable to accurately control the width of the glue band on the transfer roll 17 to conform exactly with the width of the corrugating medium 10 being used on the single facing machine. The present invention provides novel means for accomplishing this end.

In a preferred embodiment of the invention, as shown in Figs. 2 and 3, a rigid supporting frame 23 is provided. The frame 23 employs a pair of relatively straight base members 24 which terminate at one end in inverted U-shaped brackets 25 having thumb screw securing means 26 designed to engage against the vertical wall portion 27 of the glue pan 19. In the particular embodiment illustrated, a pad or block 28 is fixedly secured to the inner portion of the U-shaped bracket 25 in alignment with the thumb screw 26 to afford a more secure means for fastening the U-shaped bracket to the glue pan 19. The block 28 preferably extends the width of the frame. Also, as illustrated in Fig. 3, the particular embodiment illustrated is provided with two base members 24, one at each end of the device. For other installations, additional U-shaped brackets may be employed depending upon the length and size of the wiping device.

The free end of the base member 24 is received into a hollow bracket member 29 provided with a pair of retaining or set screws 30. Each of the bracket members 29 are fixedly engaged to a transverse plate 31, which acts as a strengthening member for the supporting frame 23. A transverse rod 32 is fixedly secured to the bracket members 29 and extends transversely of the supporting frame in substantially parallel relation to the plate 31.

A retaining plate 33 is hingedly connected, by means of a tubular rod and hinge member 34 to the outer legs 35 of the U-shaped brackets 25 preferably substantially midway the height thereof or as shown in Figs. 4 and 5. The retaining plate 33 extends substantially the entire width of the device as best shown in Fig. 3. The plate 33 is provided with semi-circular openings 36 along its upper surface which match and register with semi-circular openings 37 in a holding plate 38. The holding plate 38, in the embodiment illustrated, is secured to the retaining plate by means of threaded fastenings 39. The circular openings formed by the registering semi-circular openings 36 and 37 are adapted to receive threaded extensions 40 on adjusting rods 41.

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A backing member 42 is rigidly fixed between the outer leg portion 35 and is substantially co-extensive with the retaining plate 33. Secured to the backing member 42 is a curved, horizontally oriented projection or knuckle 43 which is shaped to conform with a similar registering indentation 44 in a rotatably mounted throw-out shaft 45 journaled in a bearing 46 fixed to the retaining plate 33. For convenience, a hub 47, having a throw-out lever, is fixed to the throw-out shaft 45.

A threaded adjusting member 48 is rotatably affixed to the threaded extensions 40 of each adjusting rod 41. The member 48 is provided with a relatively narrow neck portion defined by a collar 49. The threaded member 48 is disposed on the outer side of the retaining plate 33 and the adjacent holding plate 38 while the collar member 49 is disposed on the opposite side thereof. With the arrangement described, the adjusting rods 41 may be moved inwardly or outwardly, as desired, by rotating the member 48 on the threaded extensions 40. Since the members 48 are not free to move axially with regard to the plates 33 and 38, by reason of the narrow neck portion defined by the collar 49, the adjusting rods 41 are readily and accurately controlled by the manual rotation of the members 48.

The adjusting rods 41, illustrated in the embodiment shown in Figs. 4 and 5, are bent to extend angularly inwardly and downwardly as at 50 to a position substantially vertically beneath the outer extremity of the glue roll 18, thence horizontally inwardly as at 51 past the center portion of the glue roll. The adjusting rods 41 are then deformed angularly upwardly as at 52 to a position normally vertically above the transverse rod 32 where each adjusting rod 41 is bent horizontally right angularly as at 53 with respect to the upwardly inclined portion 52. The right angular extension 53 is pivotally disposed as at opening 54 in a vertical bar 55 pivotally connected to the transverse rod 32. The vertical bar 55 is preferably provided with transverse angular opening 56 adapted to receive a substantial portion of a trapezoidal piece of wiping material 57 as illustrated in Figs. 4 and 5. However, it is obvious that the shape of the angular opening 56 may be varied to conform with the cross section of the wiping material 57. The wiping material 57 is retained in position by means of a hold-down plate 58 which is removably affixed to the vertical bar 55 by means of threaded fastenings 59. The vertical bar members 55 may be maintained in horizontally spaced relation to each other by means of collars or washers 60 or other suitable means.

The assembled wiping device may be inserted into the glue reservoir or pan 19 by dropping the pan downwardly away from the glue roll 18 and thereby placing the upstanding vertical bars 55 behind the glue roll 18 in the position shown in Fig. 5. In a single-face corrugating machine, in which the reservoir or pan 19 is not removable, it may be necessary to disassemble the wiping device in order to facilitate placing it in the reservoir.

In the ordinary installations, two glue wiping devices are employed, each positioned adjacent an end of the glue application roll 18. It is desirable that the wiping device extend inwardly of the rolls a sufficient distance to permit wiping of the roll to provide a glue band of equal width to the smallest width of corrugating medium which will be used on the machine. For purposes of description of the device, the structure and operation of a single wiping device will be discussed.

The U-shaped brackets 25 are firmly secured to the adjacent vertical wall portion 27 of the reservoir or pan 19 by means of the thumb screw device 26. It is preferable that the supporting frame 23 be substantially parallel to and spaced from the bottom of the reservoir 19, as shown in Figs. 4 and 5, so that the adhesive is free to circulate therebeneath. The throwout shaft 45 is adjusted so that the indentation 44 therein is out of register with the projection or knuckle 43, as shown in Fig. 4. Next, the

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threaded collar 49 adjacent the outer end portions of the glue roll 18 are threaded inwardly, as shown in Fig. 3, until the wiping material 57 comes in contacting, cleaning relationship with the back face of the glue roll 18, as shown in Fig. 4. The wiping action of the material 57, in contact with the glue roll 18 may be readily observed by the operator, and additional threaded collars 49 are screwed inwardly until the proper lengths of the wiping material 57 are in contacting engagement with the back-side of the glue roll 18. With this adjustment, the unwiped portion of the glue roll 18 should be in substantially equal width to the width of the corrugating medium being processed on the machine.

Since the wiping material in the embodiment described is flexible, it is possible to make minute adjustments by slightly varying the distance the collar 49 is threaded inwardly of the threaded extension 40.

When it is desired to disengage the entire length of the wiping material 57, so that the entire length of the glue roll 18 is free to accumulate adhesive from the reservoir 19, it is merely necessary to move the throw-out lever and hub 47 to an angle of 90° so that the indentation 44 in the throw-out shaft 45 is in registering alignment with the projection of knuckle 43. In this manner, each of the adjusting rods 41 and their pivotally connected vertical bars 55 are free to swing away from the back of the glue roll 18 in spaced relation thereto.

It is thus apparent that one of the advantages of the present invention is the manner in which the improved wiping means absolutely prevents the glue or adhesive from contacting the exposed portions of the glue transfer roll 17. By carefully and accurately controlling the width of the glue band on the glue roll 18 to conform with the width of the corrugating medium 10, the exposed portions of the glue transfer roll 17 are kept absolutely free of adhesive. It is thus possible to adjust the stripper knives 15 so that the corrugating medium 10 is disposed at all times, and particularly at point 14, closely adjacent to the corrugating roll 13. Therefore, it becomes further apparent with the present novel invention, the resulting single-face material produced will be of more uniform quality than is possible when there is an adhesive coagulation and build-up on the exposed faces of the corrugating roll 13.

It is to be understood that the embodiments herein described are illustrative and not restrictive, and it is also to be understood that the invention may be susceptible of embodiment in other modified forms, and that all such modifications which are similar or equivalent hereto come equally within the scope of the claims next appearing.

What I claim is:

1. In a machine of the type described having a glue roll and a glue transfer roll in peripheral contact with the glue roll, an adjustable wiping means for the glue roll comprising a rigid base frame member having a plurality of upstanding, wiper holding members pivotally mounted on a shaft fixed thereto and disposed adjacent to and substantially parallel with the glue roll, the wiper holding members having free wiper receiving ends movable toward and away from the periphery of the glue roll, and a relatively long, bendable strip of flexible wiper material fixedly secured to the free ends of the wiper holding members and a plurality of movable adjusting rods connected to the wiper holding members and extending free of the glue roll.

2. In a machine of the type described having a glue roll and a glue transfer roll in peripheral contact with the glue roll, an adjustable wiping means for the glue roll comprising a rigid base frame member having a plurality of upstanding, wiper holding members pivotally mounted on a shaft fixed thereto and disposed adjacent to and substantially parallel with the glue roll, the wiper holding members having free wiper receiving ends movable toward and away from the periphery of the glue roll, and a rela-

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tively long, bendable strip of flexible wiper material fixedly secured to the free ends of the wiper holding members.

3. In a paperboard corrugating machine having a glue reservoir, a glue roll disposed therein and a glue transfer roll in peripheral contact with the glue roll, an adjustable wiping means for the glue roll comprising a rigid base frame member disposed within the glue reservoir and releasably secured thereto, and having a plurality of individual, upright, wiper holding members pivotally mounted on a shaft fixed to the base frame and disposed adjacent to and parallel with the glue roll, the wiper holding members having free wiper receiving ends movable away from the periphery of the glue roll, and a relatively long, flexible strip of wiper material fixedly secured to the free ends of said wiper holding members, and a plurality of movable adjusting rods connected to the wiper holding members and having ends extending free of the glue roll to adjust the relatively long strip of wiper material to thereby vary the width of the glue band on the glue roll to thereby vary and control the width of the glue band on the glue transfer roll.

4. The invention set forth and claimed in claim 3 wherein a quick release device in adjustable contacting relation with the free ends of the wiper holding members is provided for simultaneously moving the adjusting rods longitudinally to thereby dispose the wiper holding members and the wiper materials simultaneously away in spaced relation from the glue roll.

5. In a paperboard corrugating machine having a glue reservoir, a glue roll disposed therein and a glue transfer roll in peripheral contact with the glue roll, an adjustable wiping means for the glue roll comprising a generally rectangular rigid base frame member disposed within the glue reservoir and having side members disposed beneath the glue roll and rigidly connected to a transverse back member disposed in substantially parallel, spaced relation to the glue roll and to a transverse front member, the base frame member being releasably secured to the glue reservoir adjacent the transverse front member of the base frame, a plurality of discrete, upright, wiper holding members pivotally mounted on a shaft fixed to the base frame adjacent the rear member thereof and disposed adjacent to and parallel with the glue roll, the wiper holding members having free wiper receiving ends freely movable away from the periphery of the glue roll, and a relatively long, continuous, flexible strip of wiper material fixedly secured to the free ends of said wiper holding arms and a plurality of movable adjustable rods connected to the wiper holding members and extending in generally rigid angular relation to the glue roll to a position adjacent the transverse front member of the base frame and having threaded free ends extending through a transverse retaining plate, disposed substantially parallel with the transverse front member and fixedly secured with respect to the base frame, and threaded adjusting sleeves rotatably disposed on the threaded ends of the adjusting rods for axial movement thereof for imparting longitudinal movement to the adjusting rods with respect to the base member to effect an adjustment of the glue roll wiper.

6. The invention set forth and claimed in claim 5 wherein the transverse retaining plate is provided with upper and lower separable portions each having registering semi-circular openings therein adapted to form circular openings therethrough when the upper end lower portions are releasably, fixedly secured together, and wherein each threaded adjusting sleeve is provided with a portion of reduced diameter intermediate the ends thereof rotatably disposed within the said openings in the transverse member.

7. The invention as claimed and set forth in claim 6 wherein the transverse retaining plate is pivotally mounted with respect to the front member of the base frame for simultaneously moving the threaded adjusting sleeves and the adjusting rods therethrough with respect to the glue

roll and thereby permitting simultaneously movement of the entire length of the wiper material in contact with or away from the glue roll in substantially parallel relation thereto.

8. The invention set forth and claimed in claim 7 wherein the rigid base frame member is disposed in spaced relation above the bottom of the reservoir to permit circulation of the glue thereunder.

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