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METHOD AND APPARATUS FOR APPLYING HANDLES TO PAPER CUPS

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2 Sheets-Sheet 1

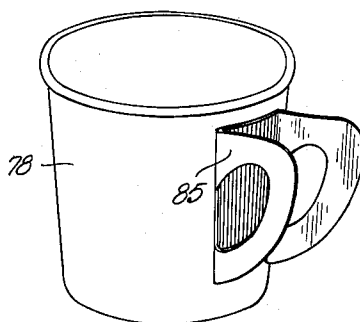
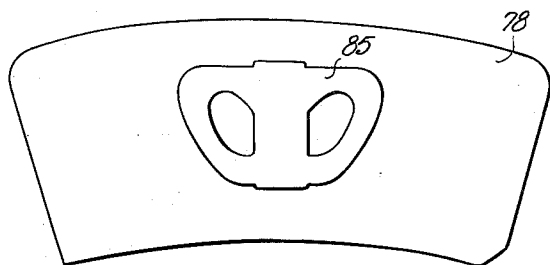
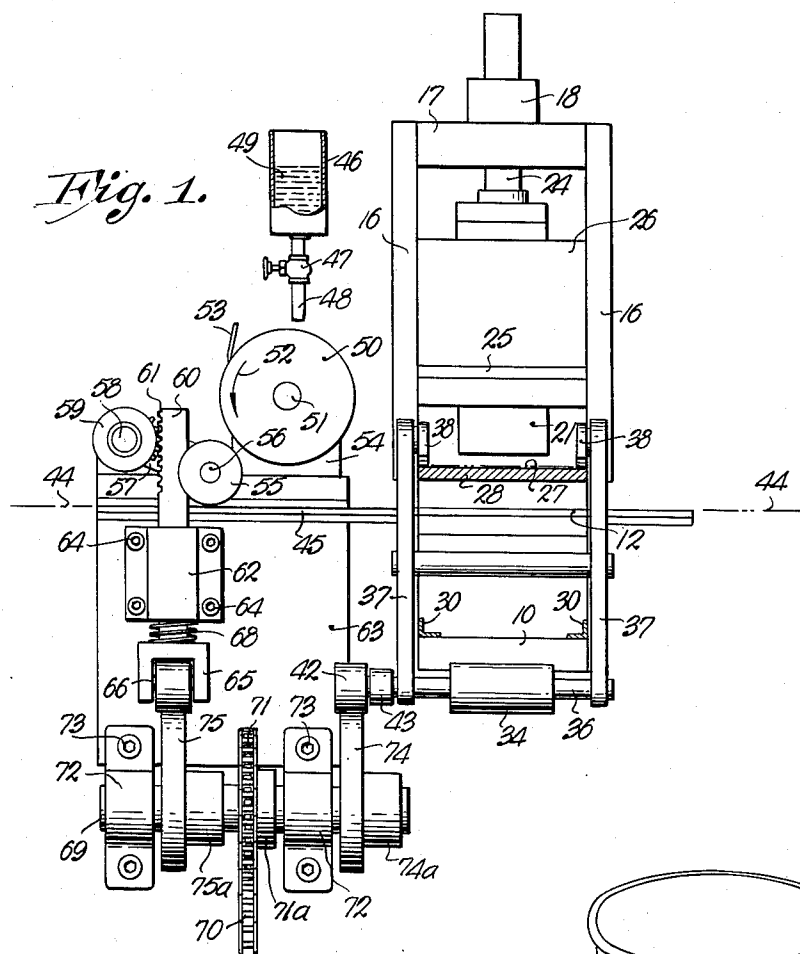


Fig. 5.

Fig. 4.

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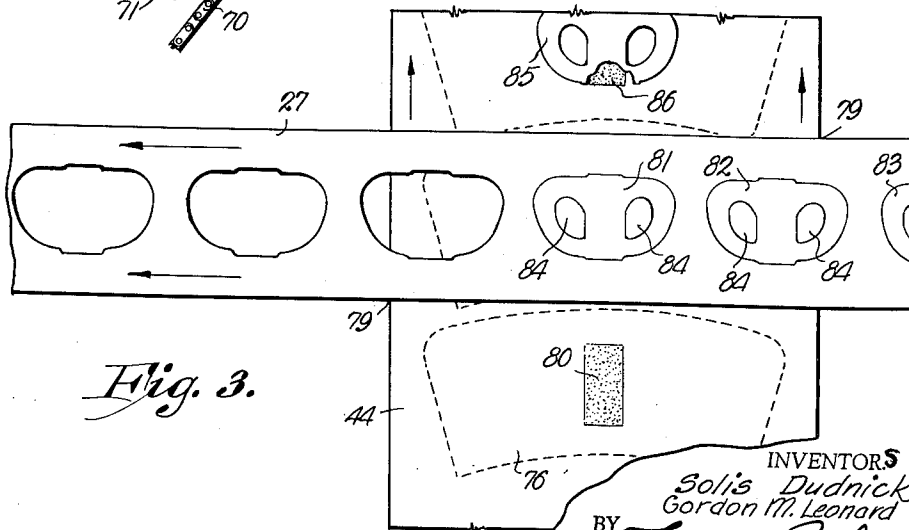
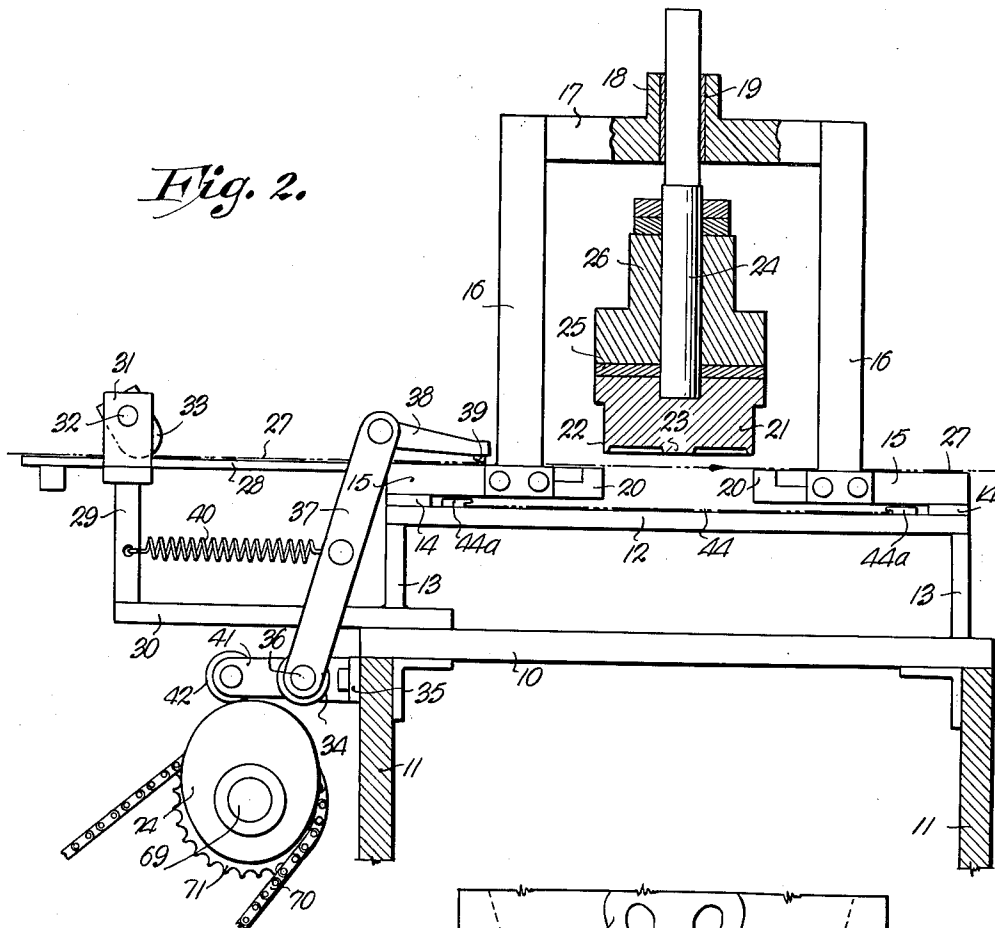
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2 Sheets-Sheet 2



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METHOD AND APPARATUS FOR APPLYING HANDLES TO PAPER CUPS

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This invention relates to methods and means of manufacture of three piece cups, and refers more particularly to methods and apparatus for applying the third piece of the assembly which functions as a handle to the cup body.

The desirability of having a handle on a paper cup is generally recognized by the user of the cup for its convenience, and by the cup manufacturer because the insulating characteristics of the handle permit the use of lighter weight material in the body of the cup.

Previously, two approaches have been employed in the art for applying handles to or providing handles on drinking cups. The first and most widely used method of applying a handle to a cup is the gluing of a handle on the otherwise finished cup. A prime difficulty with this operation is that attempts to glue the handle on the cone-shaped cup are not uniformly successful, because the original flat paper from which the handle is fabricated tends to pull away from the curved surface to which it is applied.

A variation from the foregoing procedure finds material for the handle in the body wall of the cup. The difficulty with this approach is that an excessive amount of material is required, an exceedingly complex glue pattern is necessary, and a failure of the glue pattern may produce a container which will not hold fluids at all.

The importance of proper adhesion between the handle and the body of the cup has been brought home to the manufacturer who has been faced with lawsuits from users when his product failed in this respect. Since such cups are primarily designed to hold hot fluids, the result of failure may be quite serious.

Therefore, an object of the invention is to apply a flat piece of relatively light paper to form a handle to a like flat piece of paper of similar material which is subsequently to be formed into a cup body.

Another object of the invention is to provide method and apparatus for partially manufacturing a three-piece cup, one piece being securely glued in the flat state to the second piece (also in a flat state), with the forming and application of the third piece or bottom deferred.

Another object of the invention is to provide method and apparatus by which the handle piece of a cup assembly may be applied to the piece to become the body wall in either web or blank form.

Another object of the invention is to provide method and apparatus for applying the handle piece of a cup final assembly to the body wall piece of the final cup assembly in a definite and accurate position, thus providing a uniform, attractive cup and also providing the maximum amount of available printing area on the cup.

Another object of the invention is to provide method and apparatus for making a preliminary assembly of parts for a paper cup wherein the process of applying the handle piece to the sidewall piece may optionally be combined with the printing procedure.

Another object of the invention is to provide method and apparatus for accomplishing a preliminary assembly of parts of a paper cup wherein the process of applying the handle piece to the sidewall piece may be combined with the blanking out of the sidewall piece.

Another object of the invention is to provide methods of and apparatus for providing a two-piece blank which,

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with the insertion of a third or bottom piece blank will provide a finished cup with handle.

Another object of the invention is to provide methods of and apparatus for providing flat two-piece blanks which may be employed with standard cup forming machines to provide a cup with a handle.

Another object of the invention is to provide methods of applying handle blanks to cup body blanks in a variety of processes which can readily be adapted to most of the cup manufacturing equipment presently in use.

Still another object of the invention is to provide methods of manufacture of cups with handles wherein the handles may be applied by either continuous motion or intervention.

Yet another object of the invention is to provide methods of and apparatus for applying a piece of paper designed as a handle to another piece of paper which either has been or will be cut to the proper shape to form a cup body.

Another object of the invention is to provide methods of and apparatus for applying a piece of paper designed as a handle to another piece of paper to make up the cup body wherein the handles may or may not have been preprinted, partially pre-cut, or pre-cut and wherein the cup body portion may have been blanked out, may have been printed and blanked, or yet may remain in rectangular sheet or in web form.

Another object of the invention is to provide methods of and apparatus for preassembly of portions of a paper cup wherein an intermediate product comprising handle blanks attached to body wall blanks is provided whereby the intermediate product may then be shipped economically in either roll or flat form, either such form being less space consuming and less expensive to transport than the finished article whereby it is possible for a manufacturer to reduce his shipping expenses and establish branch plants with the single function of forming and adding a bottom blank to produce a finished product.

Other and further objects and advantages of the invention will appear in the course of the following description thereof.

In the drawings, which form a part of the instant invention and are to be read in conjunction therewith, embodiments of the invention are shown and, in the various views, like numerals are employed to indicate like parts.

FIG. 1 is a side view of one specific form of apparatus adapted to practice the inventive process.

FIG. 2 is a front view of the apparatus of FIG. 1.

FIG. 3 is a schematic view from above showing a method of positioning the handle web over the cup web in the modification of the invention shown in FIGS. 1 and 2.

FIG. 4 is a view of an intermediate product comprising the invention embodying a cup blank severed from the cup web with a handle blank attached thereto.

FIG. 5 is a perspective view of a finished cup.

In the following description, one modification of the inventive process will be described relative the specific apparatus shown in FIGS. 1 and 2. In this modification of the invention, cup web is fed under and at substantial right angles to handle web at a station point. At said station point, a handle blank is punched from the handle web and applied to the cup web. The cup body web or cup web may then either be rolled up or stored in some fashion for later blanking of the cup body blanks from the web or, in the same continuous operation, may have the cup body blanks cut from the web.

Referring first to FIGS. 1 and 2, at 10 is shown a base platform which is supported by legs 11. Cup web feeding platform 12 is supported on platform 10 by legs 13. Spacing plates 14 mount handle web carrying mem-

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bers 15, to which are fixed upwardly extending vertical frame members 16. Frame members 16 support at their upper ends punch guide plate 17 having cylindrical guide 18 centrally thereof with opening 19 extending vertically therethrough. Die members 20 are fixed to the inner edges of handle web members 15 and define an opening the size and shape of the handle blanks to be punched from the handle web therebetween.

Punch 21 having shearing flange 22 around the periphery thereof and adhesive sealing portion 23 centrally thereof is mounted on shaft 24 which extends through opening 19. Resilient rubber or other like material compression plate 25 is positioned between punch 21 and body 26 of the punch. Conventional hydraulic or other means for sequentially raising or lowering the punch 21 are not shown.

Means for supporting the handle web 27 in addition to members 15 comprise table 28 continuous with members 29 and 30, the former fixed to the underside of table 28 and the latter fixed to the upper portion of platform 10. A paper stop including mounting flange 31 which carries shaft 32 on which is mounted pivotable member 33 having a rounded lower end is provided. The handle web 27 is fed from left to right in FIG. 2 and away from the viewer in FIG. 1.

Means for intermittently advancing the handle web from left to right in FIG. 2 are provided as follows: Member 34 is attached at one end to legs 11 by beam 35 and receives shaft 36 extending therethrough. Elongate paired arms 37 are fixedly mounted on shaft 36 at the lower end thereof and has feed finger 38 pivotally mounted at the tops thereof, finger 38 having one-way engagement 39 on the underside of the outer portion thereof. Resilient coil springs 40 are attached at one end to arms 37 and at the other end to frame members 29 whereby to tend to urge arms 37 in a counterclockwise direction in FIG. 2. Arm 41 is rigidly secured to shaft 36 and has wheel 42 rotatably mounted on its free end. Collar 43 (FIG. 1) is fixed to shaft 36.

Means for moving the cup web 44 from left to right in FIG. 1 and toward the viewer in FIG. 2 are not shown as they are conventional, such as feed rollers, etc. Guides 44a position web 44 on platform 12. Table 45 is an extension of platform 12 of FIG. 2 to the left in FIG. 1 to receive the cup web.

Means for applying adhesive or glue at periodic intervals to the cup web 44 comprise adhesive container 46 controlled by valve 47 and having spout 48 to pass glue 49 downwardly. Roller or wheel 50 mounted on shaft 51 receives adhesive or glue from the spout 48 at a controlled rate and rotates in the direction shown by arrow 52. A scraper or control blade 53 is provided to evenly distribute the adhesive on the roller 50. Shaft 51 is supported by stand 54 to one side of table 45. Wheel 50 is driven independently of other apparatus by a suitable power source or motor (not shown) at constant speed.

Means for transferring glue from roller 50 to web 44 comprises secondary wheel or roller 55 of limited width pivotally mounted on shaft 56. Shaft 56 is rigidly fixed to member 57, to the other end of which is fixed shaft 58. Spur gear wheel 59 is rigidly and nonrotatably fixed to shaft 58. Means for rotating spur gear wheel 59 both counterclockwise and clockwise is FIG. 1, shaft 58 likewise, and member 57 with shaft 58, comprises spur toothed shaft 60 with teeth 61 to engage the spur teeth of gear 59. Shaft 60 is vertically movably received in housing 62, which is fixed to a suitable supporting means 63 by bolts 64. Fork member 65 is fixed to the lower end of shaft 60 and mounts shaft 66 between the legs thereof which rotatably carries wheel 67. Coil spring 68 is positioned between the underside of housing 62 and the upper portion of member 65 whereby to tend to urge shaft 60 downwardly in FIG. 1.

Means are provided for actuating simultaneously the

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glue applying means previously described and the handle web advancing mechanism--also previously described. Such means comprise shaft 69 which is driven by chain belt 70 over sprocket 71. Shaft 69 is received in bearings 72 fixed to the support means 63 by bolts 73. Cams 74 and 75, respectively, act through wheels 42 and 67 to actuate the handle web advancing mechanism and the glue applying mechanism, previously described. Collars 74a and 75a adjustably fix the cams 74 and 75 to shaft 69. Collar 71a adjustably fixes sprocket 71 to shaft 69. The mechanical means illustrated for sequentially timing and relating the operation of the gluing and handle web of advancing mechanisms may be tied into the means for advancing the cup web (not shown), by conventional mechanical or electrical means (also not shown).

Referring then to FIG. 3, therein is shown a schematic view which illustrates the motion of the cup web and the handle web relative one another. Cup blanks 76, 77 and 78 are shown in dotted lines to indicate how they will later be blanked from web 44 or to define the limit of printing on the web to be included in the blank. The cup web or cup blanks may be presented in varying forms to the station indicated at 79 at the intersection of the two webs. Thus, the cup web may be without any preliminary marking or definition of cup blanks therein. Secondly, it may be the same, but with any printing on the web which it is desired to later incorporate in the cup blank. Thirdly, cup blanks may be semicircular or semi-formed in the web for ready detachment with or without printing thereon. Finally, the cup blanks may be detached or cut from the original web, with or without printing and positioned on an endless conveyor belt or other suitable means to transmit, feed or move them to the station. At any rate, however, the cup web, cup blank containing web, or cup blanks are moved by suitable means or apparatus to the handle blank applying station.

An adhesive path 80 is shown applied centrally of cup blank 76 in FIG. 3 by the adhesive applicator wheel 55, before the blank 76 reaches the station 79.

The handle web 27 in FIG. 3 may have handle printed portions 81, 82 and 83 thereon movable sequentially into position over the cup web 44 or cup blanks formed therein. Thus, handle printed portion 81 is directly positioned over the cup blank 77, ready for punching out and application to the cup blank web or cup blank therebelow. Preferably, finger holes 84 have already been punched out of the cup web before it reaches the station 79. The handle web is sheared by portion 22 of punch 21 and the central gluing bridge of the punched handle blank is applied to the glue path by punch portion 23. Cup web portion 78 has applied handle blank 85 thereon with the latter cut away centrally thereof to illustrate the glue path 86 by which it is secured to the cup blank 78. The cup web with attached handle blanks may be rolled up for storage or shipping before blanking of the cup body portions therefrom or cut into suitable lengths for storage or shipping in flat form.

FIG. 4 illustrates the cup blank 78 removed from the cup web by conventional blanking means with the handle blank 85 secured thereto, ready for processing into the final cup as shown in FIG. 5 by conventional means. This intermediate product itself may be stored or shipped prior to forming into a finished cup. It also is acceptable for use in conventional cup forming machines. In usable form, with the finger engaging portion of the blank 85 folded away from the side cup 78, it may be observed that there is free area of the cup thereunder. Such area could have been printed before the application of the glue patch whereby to obtain the maximum printed area on the cup.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advan-

tages which are obvious and inherent to the method and apparatus.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all material hereinabove set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim:

1. A method of applying handle blanks to cup body web in a process of fabricating paper cups with handles comprising feeding cup body web in a first direction over a station point whereby to periodically present an area of cup body web at a given time at said station point, feeding handle web over said station point in a second direction whereby to periodically present an area of handle web at said station point over each area of cup web, applying an adhesive to one of each said cup web area and said handle web area before they leave said station point and separating a handle blank from each said handle web area and applying same to each said cup web area at said station point in adhesive attachment.

2. A method of applying a cup handle to the body of a paper cup comprising providing a cup body blank and a cup handle blank at a station point, applying adhesive to one of said body blank and handle blank before they leave the station point and then applying the handle blank in flat form to said cup body blank in flat form at said station point in adhesive attachment.

3. A method of applying a cup handle to the body of a paper cup comprising providing a cup body blank and a cup handle blank, applying adhesive to one of said body blank and handle blank, and then applying the handle blank in flat form to said cup body blank in flat form in adhesive attachment.

4. A method of applying a cup handle to the body of a paper cup comprising providing cup body web in flat form and a handle blank in flat form, applying adhesive to one of said cup body web and handle blank, and then applying the flat handle blank to the flat cup body web in adhesive attachment.

5. A process of applying handle blanks in flat form to paper cup web comprising feeding cup body web to a station point, feeding handle web to said station point,

sequentially positioning a portion of cup body web relative to a portion of handle web at said station point at periodic instances, applying adhesive to an area of one of said portions of cup body and handle web before either leaves the station point and separating a handle blank from the handle web at the station point and applying one of said blank and cup body web to the other at said station point in adhesive attachment.

6. A process of applying handle blanks in flat form to paper cup web comprising feeding cup body web to a station point, feeding handle blanks sequentially to said station point, sequentially positioning cup body web portions relative to handle blanks at said station point at periodic instances, applying adhesive to one of said cup body web portions and handle blanks before either leave the station point and applying one of said handle blank and said cup body web to the other at said station point in adhesive attachment.

7. A method of applying handle blanks in flat form to cup blanks in a process of fabricating paper cups with handles comprising feeding cup body blanks to a station point sequentially whereby to periodically present a cup body blank at said station point, feeding handle web to said station point whereby to periodically present an area of handle web at said station point relative to each cup body blank, applying an adhesive to one of said cup body blank and handle web area before either leave said station point and applying one of a handle blank and a cup body web area to the other at said station point in adhesive attachment.

8. A method of applying a cup handle to the body of a paper cup comprising providing a cup body blank in flat form and handle web in flat form, applying adhesive to one of said handle web and cup blank, and then blanking a flat handle blank from said cup web to said flat body blank in adhesive attachment.

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