

July 21, 1942.

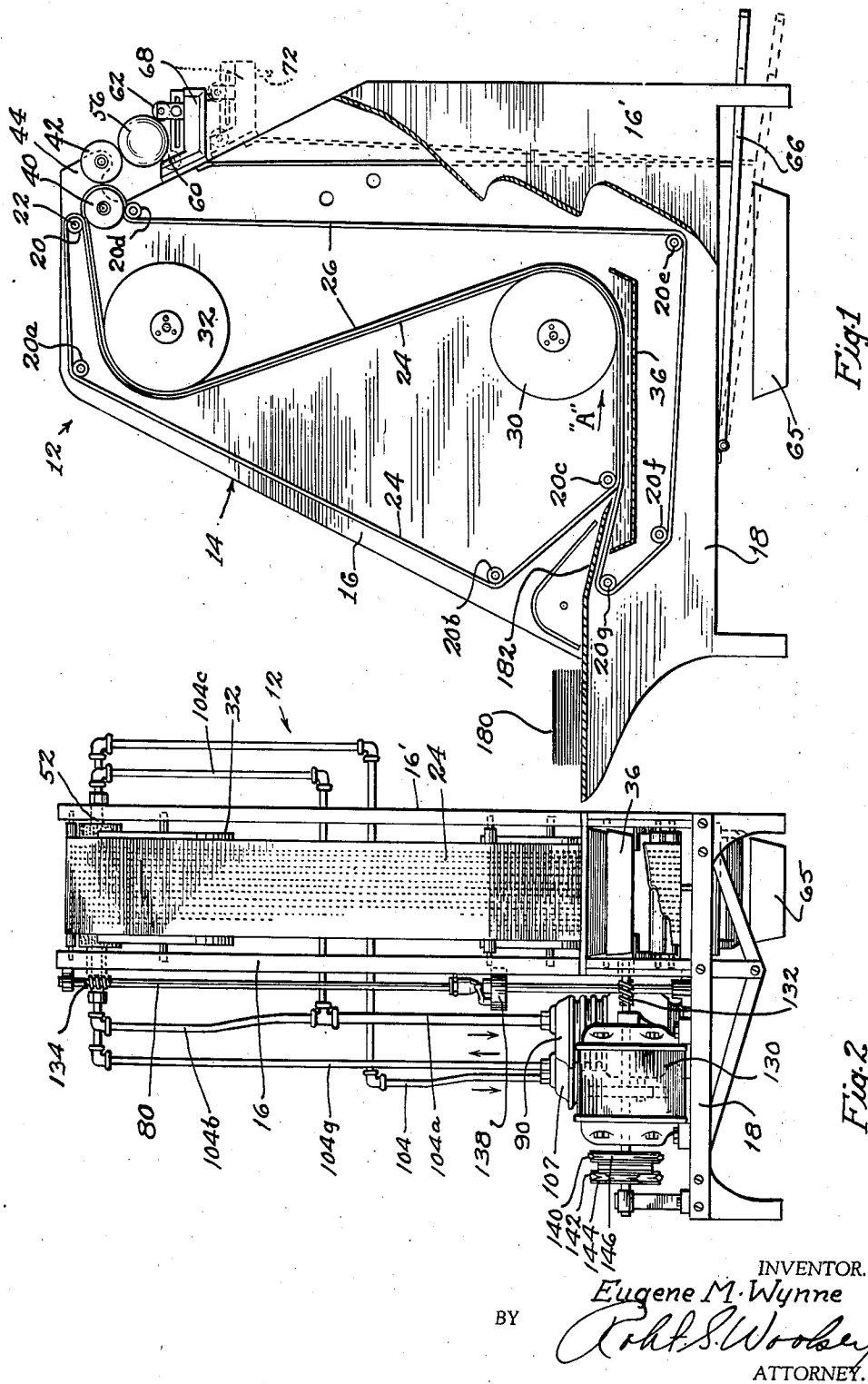
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2,290,365

MECHANICAL MEANS TO TRANSFER DECALCOMANIAS TO A RECEIVING SURFACE

Filed April 30, 1940

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

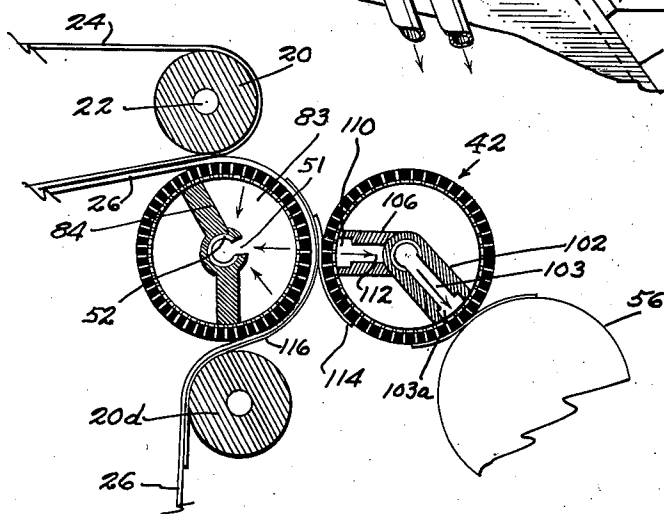
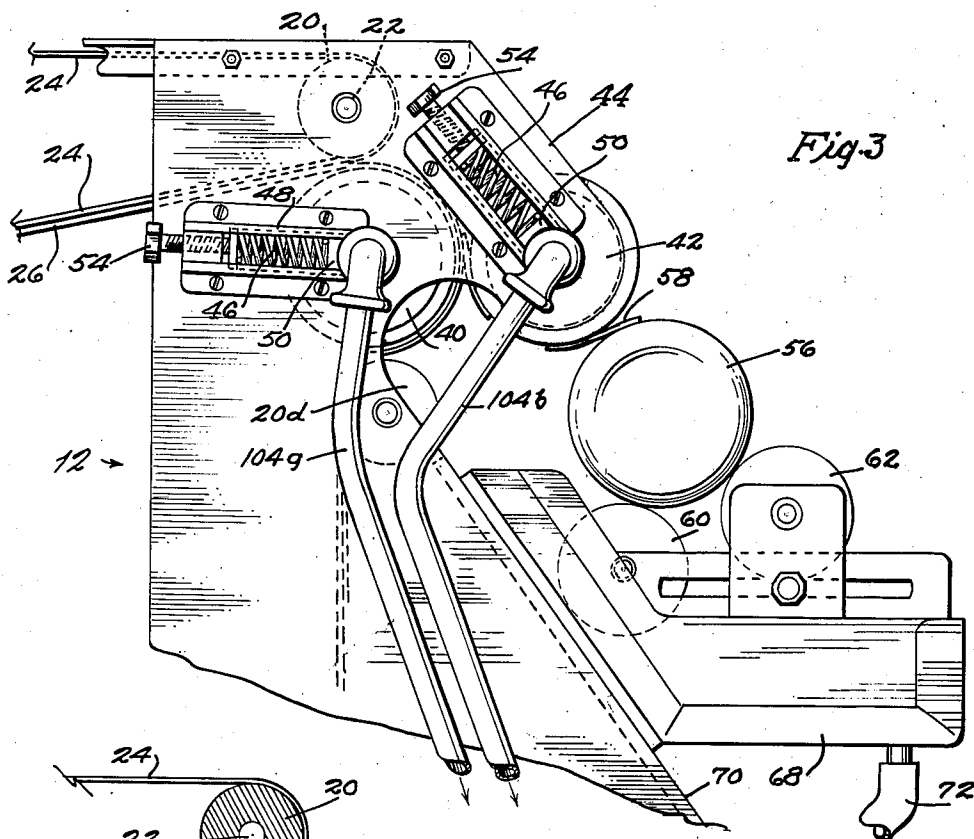


Fig. 4

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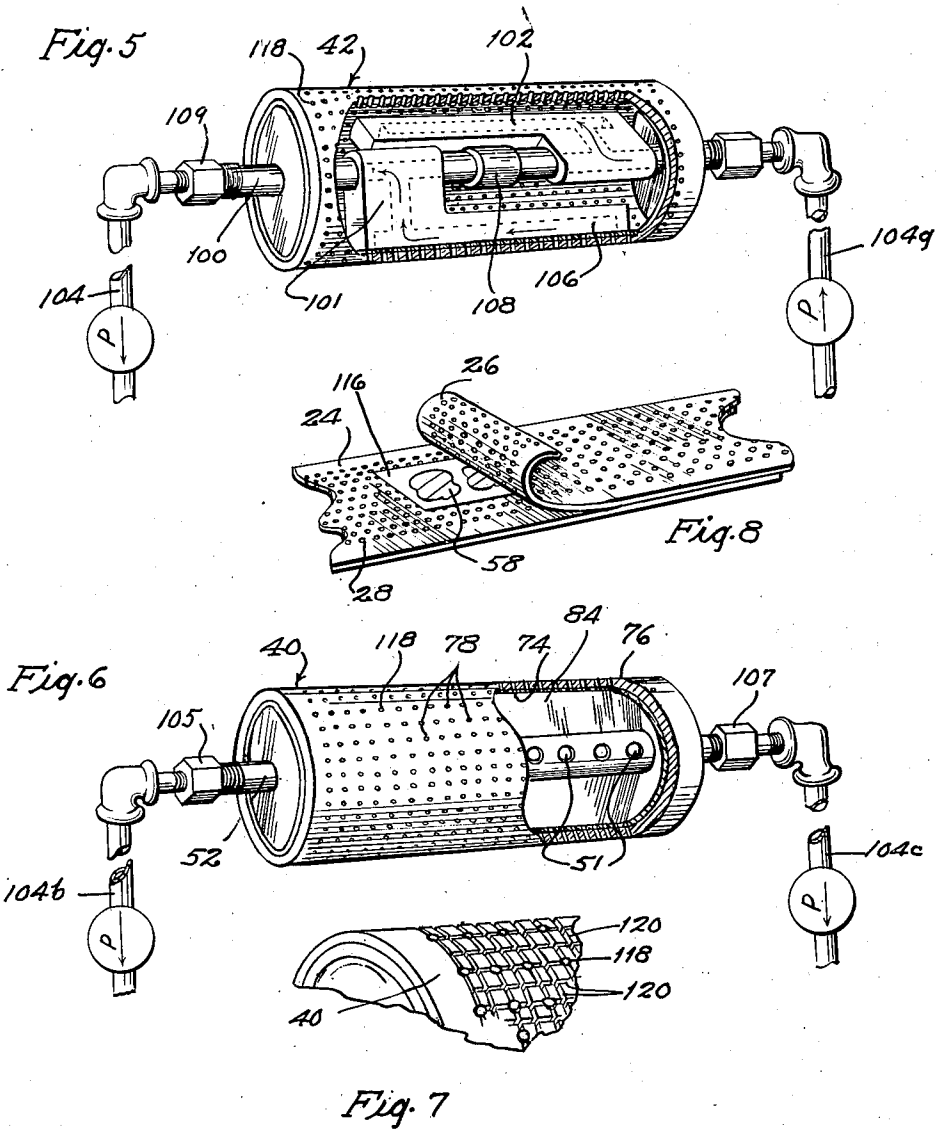
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MECHANICAL MEANS TO TRANSFER DECALCOMANIAS TO A RECEIVING SURFACE

Filed April 30, 1940

3 Sheets-Sheet 3



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MECHANICAL MEANS TO TRANSFER DECALCOMANIAS TO RECEIVING SURFACES

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Application April 30, 1940, Serial No. 332,513

9 Claims. (Cl. 41—1)

The machine of this invention relates to labeling apparatus in general, and more particularly to an apparatus to transfer decalcomanias from their normal paper backing to glass or other ware for the purpose of decoration and/or labeling.

It is an accepted practice in the glass industry to decorate or label the ware by printing directly upon the ware with a ceramic color, and ordinarily using a screen stencil permuting on the ware to form the design. This method is fairly satisfactory where the detail and registry of color is permissibly crude, but regardless of the effect obtained, the method is relatively costly, for each application of color requires that the applied color be dried before subsequent application of other color, meaning that two color work must be handled twice, three color work must be handled three times, etc., obviously even though it were possible to properly register color by this method, the cost would be extremely high in view of the necessity of multiple handling of the work.

It has been found that an ideal way to decorate and/or label glass and other ware resides in the use of decalcomanias regardless of their method of compilation, that is, whether they were formed by means of lithography, intaglio, silk-screen or any combination of the generally accepted methods as above identified.

Decalcomanias regardless of the method by which they are formed, comprise a pictorial or other representation composed of laying color on color, the base of which rests upon a water soluble gum mounted upon a paper backing, so that when it is desired to remove the decalcomania from its paper backing or support it is only necessary to thoroughly wet the paper backing, this action tends to dissolve the gum upon which the color rests, thereby enabling the skidding of the color from the slippery gum surface, which act is ordinarily accomplished as a manual act.

However, the manual application of a decalcomania from its paper backing or support to an article to be decorated thereby, is a slow, tedious, and relatively expensive task, and in view thereof, it is as a general premise of the present invention, to provide means to effect the transfer of a decalcomania from its backing to an object adapted to receive the same.

A further and more specific object of the invention is to provide mechanical means to successively wet and then remove a decalcomania from its paper backing and apply the same to an object adapted to receive the decalcomania.

Another object of the invention is to provide

mechanical and continuously operating means to wet a decalcomania whereby it may be freed from its support, and then to successively effect its transfer to a plural number of surfaces, one of which is adapted to effect permanent affixation of the decalcomania to an object adapted to receive the same.

An additional object of the invention resides in the application of means continuously operable to wet a decalcomania to loosen the same from its normal support, and then to relieve the support of the decalcomania in such manner as to cause it to temporarily be attached to a cylindrical surface for re-deposit upon an object adapted to receive the same.

A further object of the invention resides in the provision of continuously operable means to wet a decalcomania paper support and the delivery of the same to a cylinder to which the decalcomania adheres by external air pressure and the subsequent transfer of the decalcomania to a second cylinder by reason of the application of a greater degree of external air pressure followed by a blowing action from within the said second cylinder to effect removal of the decalcomania to an object adapted to receive the same.

A further object of the invention resides in the provision of a belt, in a belt conveyor system, having a multitude of apertures therein whereby an object carried by the said conveyor can and will be quickly wetted when the conveyor is immersed in water.

A further object of the invention resides in the provision of a belt, in a belt conveyor system, having a multitude of apertures therein whereby an object carried by the said conveyor belt system can and will be quickly and thoroughly wetted when the conveyor belt system is immersed in water and whereby suction or air pressure is instantly relieved and an object carried upon the said belt(s) is free to travel a course contrary to the direction of the said belts.

A further object of the invention resides in the provision of a belt, in a belt conveyor system, having a multitude of apertures therein whereby an object carried by the said conveyor belt system can and will be quickly and thoroughly wetted when the conveyor belt system is passed through water, and whereby suction or air pressure operating upon the exterior of the belts is instantly relieved when the belts of the conveyor system are caused to move divergently and an object carried by the said belts is free to travel a course contrary to the direction of the said

belts when freed of mechanical pressure by the said belts.

A still further object of the invention in a machine to transfer a decalcomania from its backing to an object by means of pneumatic pressure, resides in the employment of co-operating and adjacent cylinders one of which adapted to receive air of atmospheric pressure in part at least, while the other of the cylinders is zoned to receive along a longitudinal path, air of atmospheric pressure in greater degree than said first mentioned cylinder, and having a second zone longitudinally of the cylinder out of which air under pressure will flow, so that a decalcomania will adhere to the first mentioned cylinder by pneumatic pressure and subsequently will be transferred to the second mentioned cylinder by reason of the application of greater pneumatic pressure, and lastly will be expelled from the second mentioned cylinder by an outwardly directed pneumatic pressure whereby the decalcomania is lodged upon an object adapted to receive the same.

A still further object of the invention in a machine to transfer a decalcomania from its backing to an object adapted to receive the same, and employing pneumatic pressure in the functional accomplishment thereof, resides in the juxtapositioned relationship of a plural number of pneumatic cylinders and the physical contact between one of said cylinders and the object upon which the decalcomania is to be affixed, whereby one of said cylinders is adapted to receive a decalcomania from a delivery point by pneumatic pressure and then transfer the decalcomania to the second of said cylinders by the application of a greater degree of pneumatic pressure, and then re-transfer the decalcomania to an object in substantial physical contact with the said second cylinder by pneumatic pressure blowing from a zoned area of the second cylinder.

In a machine to transfer decalcomanias by pneumatic pressure, it is an object to provide rotating cylinders formed with perforations in the outer surface thereof in combination with a system of conveyor belts having similar sized perforation so that when a decalcomania is conveyed to a point adjacent a first one of said cylinders a column of air may pass through said belt and into said cylinder to hold the decalcomania on the belt and adjacent the said cylinder pending contact with a second one of said cylinders whereupon a column of air under a greater degree of impulsion will cause said decalcomania to move to said second and rotating cylinder, subsequent to which operation air blowing out of said perforations and from said second cylinder will cause the removal of the decalcomania therefrom.

A still further object of the invention, in a machine to transfer decalcomanias by pneumatic pressure, is to provide a plural number of cylinders having perforated exterior surfaces upon which perforated belts are adapted to travel as the cylinders rotate upon mandrils, one of said cylinders having a baffle plate delineating the interior thereof into unequal areas, one of which is adapted to receive air drawn through the mandril thereof, the other of the cylinders being provided with interior and horizontally positioned, non-rotatable mouths mounted upon the mandril thereof, one of said mouths being adapted to confine air drawn through its mandril and the perforations to a limited horizontal belt along one face of the cylinder, the other of the

said mouths being adapted to expel air through a second horizontal belt of perforations, whereby a decalcomania will be caused to adhere successively to the first and then the second of the said cylinders by reason of unequal velocities of inwardly moving columns of air, and then the subsequent removal of the decalcomania by reason of outwardly directed air pressure.

Further objects, features, and advantages of the invention may appear from the accompanying drawings, the specification, and the subjoined claims.

In the drawings, of which there are three sheets, and in which:

Figure 1 is a side elevation, partially in section showing the machine of this invention.

Figure 2 is a rear elevation of the machine of this invention showing construction thereof in general.

Figure 3 is a detail showing the cylinders used to remove a decalcomania from its backing and to effect transfer thereof to a bottle, tumbler, or other object.

Figure 4 is a detail showing the pneumatic cylinders in functional position, the same being in section to illustrate the means used to confine and direct movement of air both into and out of the cylinders, the view shows the relative position or operative relationship between the cylinders and the object upon which the decalcomania is to be transferred.

Figure 5 is a perspective view, a portion of which is broken away to show interior arrangement of the mouths adapted to direct inwardly and outwardly moving air currents to cause adherence and subsequent expulsion of a decalcomania therefrom.

Figure 6 is also a perspective view, being illustrative of the other of the cylinders and being partially broken away to illustrate the baffle wall used to delineate the interior of the cylinder into areas, one of which is adapted to receive air from without the cylinder to cause adherence of a decalcomania by air pressure.

Figure 7 is a detail of a cylinder surface, wherein minute grooves cross the surface thereof to effect channel-ways for air moving toward the cylinder perforations.

Figure 8 is fragment of the perforated belts used to convey a decalcomania from a supply source, through a water bath to loosen the decalcomania, and to convey the loosened decalcomania to a point of transfer.

The machine 12 of this invention comprises a superstructure 14 having sides 16 and 16' which are supported upon a base 18. Positioned between the sides 16 and 16' I mount a plural number of rollers 20 suitable mounted upon shafts 22 secured in the said side-wall. Two closed belts 24 and 26 having perforations 28 therein are adapted to be placed upon and run over the rollers, and for the purpose of this description it will be assumed that belt 24 runs over rollers 20, 20a, 20b, 20c and the large rollers 30 and 32, while belt 26 travels over rollers 20d, 20e, 20f, 20g, and also over each of the large rollers 30 and 32. It is also to be noted that in this system of belts which in reality form a conveyor system, that the roller 20c forms the point of beginning of parallel belt travel and that this parallel belt relation continues over each of the large rollers 30 and 32 until roller 20 is reached, thereafter the belts 24 and 26 separate and move over the aforementioned rollers to the point of tangency at roller 20c.

It is also to be noted in connection with the belts, that between rollers 20c and 30, that they move through a pan or trough of water 36, the full purpose of which will be hereinafter set forth.

In the upper part of the super-structure, I position the cylindrical rollers 40 and 42 which are fundamentally distinct from the previously mentioned rollers which in reality are idlers upon which the stated belts travel.

Of the cylindrical rollers, roller 40 is mounted in juxta-positioned relation to roller or idler 20 and forms the point of return for belt 26, and the exact relation-ship between the idler 20 and roller 40 is such that they are spaced only sufficiently to permit the combined belt thickness, in addition to the thickness of a decalcomania to pass between their adjacent faces.

Roller 42 is positioned adjacent roller 40, being so supported in an extension 44 of the super-structure which forms a bracket support therefor. The spacing between these rollers is only sufficiently large to permit passage of one of the belts 26 and the decalcomania, and to ensure a firm and snug contact between these rollers. Roller 40 is placed under tension by means of a spring 46 operating in a guide 48, and having its one end thrust against a bearing 50 which in turn carries the mandril 52 upon which the cylinder is adapted to rotate, while the other end of the spring may be placed under adjustable pressure by means of a screw 54. The roller 42 is similarly mounted in so far as spring tension is concerned, however, here the purpose of the applied tension is to maintain equilibrium between the roller 42 and a bottle, glass tumbler, or other object 56 upon which the decalcomania 58 is to be affixed. The object 56 when in decalcomania receiving position is layed upon idlers 60 and 62 which are adjustably positioned with respect to each other and with respect to the roller 42 so that various sized objects 56 can be placed thereon and brought into functional contact with the roller 42 in response to foot or other pressure applied through the treadle 66, for the support 68 of the rollers 60 and 62 is vertically slidable along the oblique surface 70 of the super-structure. A drain 72 facilitates removal of surplus water accumulating from the wetted decalcomania.

Reference is again made to the rollers 40 and 42, for the purpose of describing their detailed construction.

The roller 40 is a metallic cylinder having a multitude of apertures 74 in the surface thereof, while the exterior is covered with a suitable resilient material 76 which is also provided with apertures 78 which are in alignment with the apertures 74. The cylinder 40 is power driven by means of a worm drive effected through power shaft 80, and rotates upon a mandril 52. The power drive is best shown in Figure 2, while the remainder of the structure is best shown in Figures 4 and 6. A baffle plate 84 is fixedly secured upon the mandril 52 and is adapted to divide the interior of the cylinder into two divisions, the larger one being a chamber within which air is drawn through the apertures, aforementioned. This chamber or zone being one of diminished or less than normal atmospheric pressure due to action of the vacuum pump 90. The free ends of the baffle plate 84 being closely adjusted to provide minimum clearance with the inner surface of the cylinder 40.

The cylinder 42 is similar in exterior appearance to cylinder 40, being also provided with a metal wall surface having a multitude of apertures, and having upon its outer surface a covering of resilient material through which a great many apertures also extend in alignment with the openings in the metallic wall or base thereof, so that air may pass from the outside of to the interior of the cylinder, modified and directed as will be shown.

The mandril 100, upon which the cylinder rotates, has an L shaped member 102 fixedly secured thereon, and as shown in Figure 4 this member is downwardly and outwardly inclined at an approximate angle of 45 degrees whereby the medial portion of the discharge passage 103 is in alignment with the center of the object 56.

The mandril 100 is of course hollow for the purpose of conducting air under pressure from the pump 107 to the discharge passage 103 from which it flows through the widened mouth 103a, from which point it will flow through the apertures in front thereof to force a decalcomania from adherence to the outer surface thereof. Figures 4 and 5 clearly show the direction of air travel or movement associated with the function of final removal of the decalcomania.

The cylinder 42 is also provided with a second L shaped member 106 which is substantially identical to the member 102, being also fixedly secured to the mandril 100 but upon the opposite end thereof in the cylinder and upon the opposite side of a blank located within the coupling 108, for as will be shown, the mandril is used to conduct both positive and negative air pressures.

The longitudinally positioned mouth 110 of air intake passage 112 is located to be nearest the point of tangency of the cylinders 40 and 42 so that the area of low pressure, created by the vacuum pump 90, is limited and hence concentrated, whereby the leading edge 114 of a decalcomania will be lifted and drawn to the surface of the cylinder 42, while the paper backing 116 thereof will remain in adherence to the perforated belt 26 for the reason of its greater surface tension upon the said belt. In Figure 7 a detail of the surface of the cylinders 40 and 42 is shown, here it will be noted that each of the apertures 118 is connected with an adjacent aperture by means of small grooves 120 thereby providing channels for either ingress or egress of air depending only upon its direction of forced travel and accordingly increasing the mean effective area of air pressure upon the decalcomania and its paper strip backing.

The machine of this invention is power actuated by means of an electric motor 130 mounted upon the base 18. One end of the power shaft of the motor is provided with a worm or other gear 132 connection with the shaft 80, the upper end of which is in worm or other gear connection 134 with the roller 40 as previously stated. The particular type of drive connection the gear 134 with the exterior of the cylinder 40 is of minor importance and hence is not shown in detail, suffice to state, any type of drive connection the exterior of the cylinder 40 with the gear 134 is satisfactory, provided only that the cylinder is caused to rotate upon the stationary mandril 52 thereof.

A clutch 138 is placed in the vertical shaft 80 for the purpose of controlling the movement of the parts actuated thereby without stopping the motor 130, and the type of control used to en-

gage or disengage the clutch is matter with which the invention is not concerned.

The vacuum pump 90 and the pressure pump 107 are driven by belts 140 and 142 operating over the motor driven pulleys 144 and 146. The pumps being connected to the cylinders 40 and 42 through pipes, including the pipe 104, as will be set forth in the description of operation.

Operation of the machine of this invention may be described as follows:

Upon energizing the motor 130 through a source of power not shown, the perforated belts 24 and 26 are driven over their respective idlers, and of these belts, belt 26 also travels over the cylindrical roller 40. This motion is obtained through the power connection with the motor effected by the gear 132, clutch 138, shaft 80 and gear 134, which latter unit is in geared connection with the cylinder 40 whereby it may rotate upon its stationary mandril 52.

Simultaneously with this action, the motor 130 also drives the pumps 90 and 107 through the belt drive arrangement, to effect an inhalation and exhalation from the cylinders 40 and 42. The pump 90 has connected thereto a piping system which includes the principal pipe 104a and branch pipes 104b and 104c. These branch pipe lines are connected with the cylinder 40 through a suitable stuffing box or coupler arrangement at 105 and 107. Operation of the pump 90 causes an intake of air through those apertures 118 in the cylinder 40, thence into the larger of the chambers or chamber 83, from which it enters the hollow mandril 52 through the openings 51 therein, the air being then drawn through the stated pipes to the pump 90 from which it is exhausted. The pump 107 is shown as having two pipes in connection therewith. The pipe 104 being in connection with the cylinder 42 through the coupling 109 whereby action of the pump will draw air through the apertures 118 from which point it enters the mouth 110 of the L shaped member 106 and flows to the pump 107 where it is expelled through pipe 104g through which it flows and enters one division of the mandril 100, then entering the L shaped member 102 it is permitted to discharge through the wide mouth 103a thereof and thence through the apertures formed in the surface of the cylinder concerned.

With the belts 24 and 26 in motion as aforementioned, and the pumps 90 and 107 in operation whereby air will be drawn through the apertures 118 of cylinder 40 and through a zoned area of the apertures in cylinder 42, and expelled through a zoned area of other of the apertures in cylinder 42, it is only necessary to feed decalcomanias (manually or automatically) from the stack 130, from which point they are slid downwardly over the inclined rest 182, from the end of which they pass between the belts 24 and 26 operating over idler 20c, then moving in the direction of the arrow "A," and passing through the shallow pan or trough of water 36, the belts with the decalcomania(s) imprisoned therebetween pass over the large idler 30. During this interval the decalcomania and its paper support have become thoroughly wetted since the belts are perforated and water is immediately accessible thereto. From the idler 30 the wetted belts and decalcomania continue upwardly and over the other of the large idlers 32, after which the belts are directed laterally, the belt 24 passing over the idler 20, while belt 26 passes over the cylinder 40. Both belts continuing over their

respective idlers until they again become tangential at idler 20c. As the belts separate adjacent the idler 20 and cylinder 40, the decalcomania follows the belt 26 over the cylinder for the reason that air is being drawn through a portion of the surface thereof. Reference again made to Figure 4 will show that the baffle plate 84 is formed with a portion thereof rearwardly inclined from a medial vertical plane there-through, this being so in order that air will enter the cylinder before the decalcomanias become tangential to the idler or the cylinder, hence, as between the tension exerted by the parting belts on the decalcomania, there is the added pressure of inwardly moving air which upsets an otherwise balanced condition and impels the decalcomania to follow belt 26.

As the decalcomania and its backing is held to the surface of cylinder 40 because of air pressure upon the surface thereof, the cylinder is rotated clock-wise, and because of frictional contact or drive, the cylinder 42 is rotated counter-clockwise. This rotation of the cylinder 40 carries the decalcomania downwardly, and upon reaching substantial tangency with the cylinder 42, the leading edge of the decalcomania is drawn across to the cylinder 42 and is held in contact therewith by reason of air moving through the apertures 118 of the cylinder 42 and thence into the horizontally stationed mouth 110 of the L shaped member 106, while the paper backing remains in contact with the belt 26 and the adjacent surface of the cylinder 40.

The separation of the decalcomania proper, as distinguished from its entirety including the paper backing 116, is due to the fact that the backing affords a greater surface for air pressure upon the cylinder 40 to operate against than does the decalcomania proper.

Also, for while any ordinary paper stock may be considered porous within varying limits, nevertheless, the paper stock does offer a relatively high resistance to passage of air, hence the principal force holding the decalcomania in position at this point resides in the natural tension exerted by the largely dissolved gum upon which the decalcomania is based. However, since there is no restriction or impedance placed upon passage of air into cylinder 42, largely because grooves 120 facilitate movement of air through apertures 118, the greater force is prevailing in that direction, hence the decalcomania moves across to the cylinder 42 and is carried therewith.

As the cylinder 42 continues to rotate, the decalcomania thereon is carried in front of the mouth 103a from which air under pressure is being forced through the numerous apertures 118 in the surface of the cylinder, and since air also moves through the grooves 120 in connection with the apertures (see Figure 7), the decalcomania is readily lifted from the surface of the cylinder and is thrown into contact with the surface of the object 56 upon which it is proposed to effect the transfer. Since the surface of the cylinder is covered with a resilient material, it will be clearly apparent that the decalcomania will be brought into firm contact with the surface of the object 56, and for the added reason that the treadle 66 is operated to lift the object and effect any desired and reasonable pressure upon the cylinder. Since the surface of the object 56 is non-porous, and since the surface of the cylinder is resilient, the decalcomania will be firmly and tightly forced into contact with

the object, even though the surface thereof is stippled or otherwise roughened within limits. Also, since the action of the cylinder and the object is to first cause adherence of the leading edge of the decalcomania to the object, followed by progressive fixation of the remainder of the decalcomania, it will be apparent that moisture and air-pockets will be eradicated under the surface of the decalcomania when finally placed in position. This action is of the utmost importance for in order to give proper service, the decalcomania must be freed of such insecurity, otherwise the decalcomania is apt to become loosened or may become weakened and frayed at such points. Also, if the object 56 with the decalcomania thereon, is placed in a kiln, the presence of air blisters or water may and in all probability would cause the same to explode, thereby ruining the appearance of the decalcomania transfer.

During the interval that the decalcomania is being thus affixed to the object 56, the paper backing 116 adhering to the belt 26 by surface tension is being carried downwardly, and upon reaching the bend caused in the belt by the idler 20c, automatically falls into discard and into the receptacle 65, for the reason that the resistance to flexure is greater than the surface tension due to lack of moisture, hence the paper backing snaps loose and falls into the receptacle 65.

Further operation of the machine is merely repetitious of the aforementioned description as to one decalcomania, however, it is believed that it will be apparent, to all those skilled in the decalcomania art, that I have provided a relatively simple, positive, low cost, and easily controlled machine to transfer a decalcomania from its backing to an article or object adapted to receive it, wherefore;

It would appear obvious that various changes and modifications and variations may be made in practicing the invention in departure from the particular showing of the drawings, and description as given, without however, departing from the true spirit of the invention as defined by the scope of the appended claims, which form the true measure of this invention.

I claim:

1. In a machine to transfer wetted decalcomanias from their normal paper backing to an object adapted to receive them, a conveyor belt system adapted to move a decalcomania from a source of supply to a point of transfer, and power actuated rotating pneumatic cylinders, pneumatic means operating on one of said cylinders to cause a belt delivered decalcomania and its backing to move in to contact with the face thereof, the other of said cylinders being pneumatically actuated to effect lifting of the leading edge of the decalcomania from its backing and said first mentioned cylinder whereby the separated decalcomania will adhere to the said second cylinder, and other pneumatic means to eject the decalcomania therefrom from the said second cylinder and cause it to adhere to a receiving object in contact with said second mentioned cylinder.

2. In a machine to transfer wetted decalcomanias from their normal paper backing to an object adapted to receive them, a conveyor belt to move a decalcomania from a source of supply to a point of transfer, a shallow bath through which said decalcomania is moved to wet the same, and power actuated rotating pneumatic cylinders, pneumatic means operating in one of

said cylinders to cause a belt delivered decalcomania including its backing to move in a course adjacent a segment of the face thereof, the other of said cylinders being pneumatically actuated to effect separation of the decalcomania from its backing from said first mentioned cylinder whereby the separated decalcomania will adhere to the said second cylinder, and other pneumatic means to eject the decalcomania therefrom and cause it to adhere to a receiving object in substantial contact with said second mentioned cylinder by surface tension effected by rolling of the cylinder on the transferred decalcomania.

3. In a machine of the character described, said cylinders being perforate whereby air may flow through the walls thereof, one of the cylinders being constructed whereby at least one half of its perforate surface is adapted to receive in-borne air to hold a decalcomania and its backing in substantial contact therewith, the other of said cylinders being constructed to receive in-borne air through a zone of perforations nearest said first mentioned cylinder whereby a differential in air pressures moving into the respective cylinders will effect movement of the decalcomania to the second of said cylinders, and pneumatic means operating through a second zone of perforations in the second mentioned cylinder to eject the decalcomania from contact therewith and to affix the same upon an object.

4. In a machine of the character described, a pair of belts adapted to move circuitously and in side to side contact during a portion of their movement to transfer an article, a sheet of water to wet said belts and article, said belts having numerous perforations therein to facilitate wetting the article held between said belts when moved through said water and negative air-lock between said belts and the article when the same has been released by the belts, a pair of synchronously operable perforate surfaced cylinders rotatable over hollow mandrils, a pneumatic pumping system connected to said mandrils whereby air may be forced to ebb and flow through predetermined portions of said cylinders, means utilizing differential pressures of air to cause a decalcomania to adhere to one of the belts in moving over one of said cylinders to bring it adjacent the second cylinder for transference thereto following which act said decalcomania is forced upon an adjacent object for affixation.

5. In a conveyor system, a pair of belts to substantially encompass a relatively thin and flat sheet of paper from a supply to a delivery point during which interval said belts and said sheet of paper are moved through fluid to treat said sheet of paper, said belts being formed with numerous apertures therein, whereby said sheet of paper will be readily accessible to said fluid and to subsequently relieve pneumatic pressure upon said sheet of paper when the same has been physically released by said belts at said delivery point.

6. In a decalcomania transferring machine to effect transfer of a decalcomania to an object, means to convey a decalcomania and its support through a water bath and deliver the same to pneumatic cylinders, a pneumatic pumping system to effect forced movement of air, a pair of cylinders in adjacent surface contact and having numerous minute apertures in the surfaces thereof, means connecting said pumping system with said cylinders whereby air will be free to move through said apertures, one of said cylinders being formed with a baffle wall to limit movement

of air through its apertures to less than the whole of the cylinder surface, means within the other of the said cylinders to confine movement of air through the apertures thereof to a longitudinal zone at the point of tangency of the cylinders, and other means within the second cylinder to direct an outward movement of air therefrom to a relatively narrow horizontal zone substantially removed from the first said zone whereby an object may be brought into contact with the second cylinder to receive the decalcomania when ejected by outward movement of air.

7. In a decalcomania transferring machine, a pair of pneumatic cylinders in longitudinal surface contact, a pair of perforated belts, rollers over which one of said belts travel, and other rollers, including one of said cylinders over which the other of the belts travel, means to move a decalcomania receiving object to and from contact with one of said cylinders, said belts being adapted to convey a decalcomania from a source of supply through a water bath to a point of surface contact between said cylinders, means to drive said belts and said cylinders, a pneumatic pumping system in piped connection with said cylinders, means including the provision of apertures formed in the surfaces of said cylinders whereby a decalcomania including its backing is pneumatically held upon the belt running over one of the cylinders to bring the decalcomania into contact with the second of said cylinders at its place of surface contact with the first of the cylinders, pneumatic means operating in the second of said cylinders to transfer the decalcomania from its backing to the surface thereof, and other pneumatic means zoned from the transfer point to expel the decalcomania from the surface of the second cylinder to an object moved into contact therewith.

8. In a machine of the character described a pair of continuously operated perforated belts adapted to travel in side to side contact during a portion of their movement whereby a decalcomania held therebetween is carried from a point of supply to a delivery point, a pair of per-

forate surfaced cylinders power actuated upon fixed and hollow mandrils, baffle plates within said cylinders, said baffle plates being so positioned as to zone the surfaces of the cylinders for movement of air therethrough, and pneumatic pumping means to effect a continuous movement of air into given zones of both of said cylinders and concurrently to effect movement of air from a zone in one of said cylinders whereby a decalcomania will be first drawn to one of said cylinders and in a continuing operation be subsequently drawn to the other of said cylinders after which adherence the decalcomania is ejected from the said second cylinder by movement of air from one of the zoned areas of the second cylinder.

9. In a machine of the character described, a pair of continuously operable perforated belts adapted to travel in side to side contact during a portion of their movement to carry an article releasably positioned therein from a supply to a transfer point, a pair of surface perforated cylinders power rotated by one of said belts upon fixed and hollow mandrils, said cylinders being in peripheral contact, a pneumatic pumping system connected with said mandrils, a non-rotatable baffle plate positioned in one of said cylinders to zone movement of air thereinto, non-rotatable breathers positioned within and extending longitudinally of the second of said cylinders, one of said breathers being adapted to confine inward movement of air whereby an article is drawn to the said second cylinder and held in surface contact therewith during a partial single rotation, the other of said breathers being adapted to conduct an outward movement of air through zoned perforations in the associated cylinder to expel the article from surface adhesion thereon whereby said article will successively move from said belt on the said first mentioned cylinder and then move to and from the second of said cylinders to a receptive surface in substantial contact with the second of said cylinders.

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