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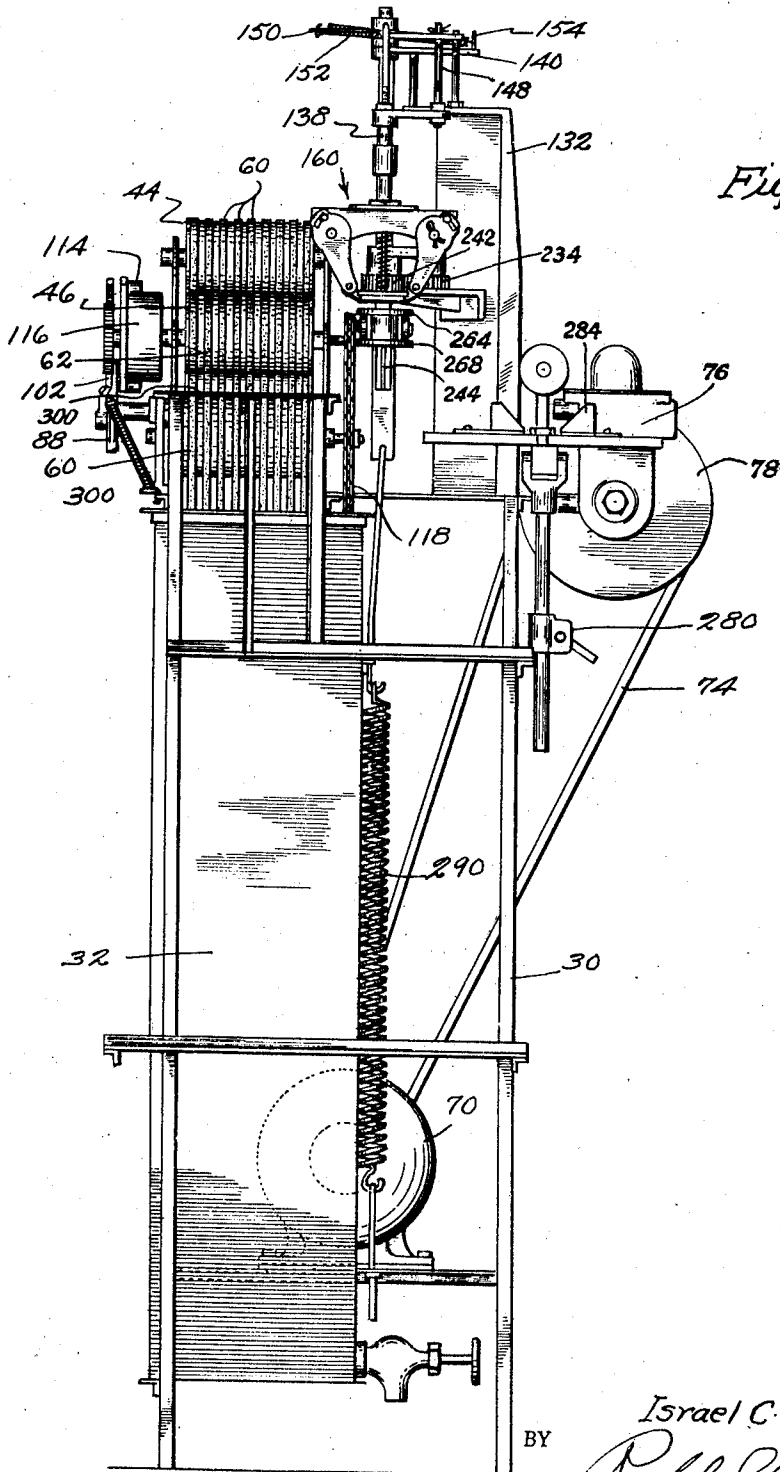
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2,305,553

DECALCOMANIA TRANSFERRING MACHINE

Filed May 6, 1940

10 Sheets-Sheet 1



INVENTOR.

Israel C. Orswell

BY

Robert S. Wooley

Dec. 15, 1942.

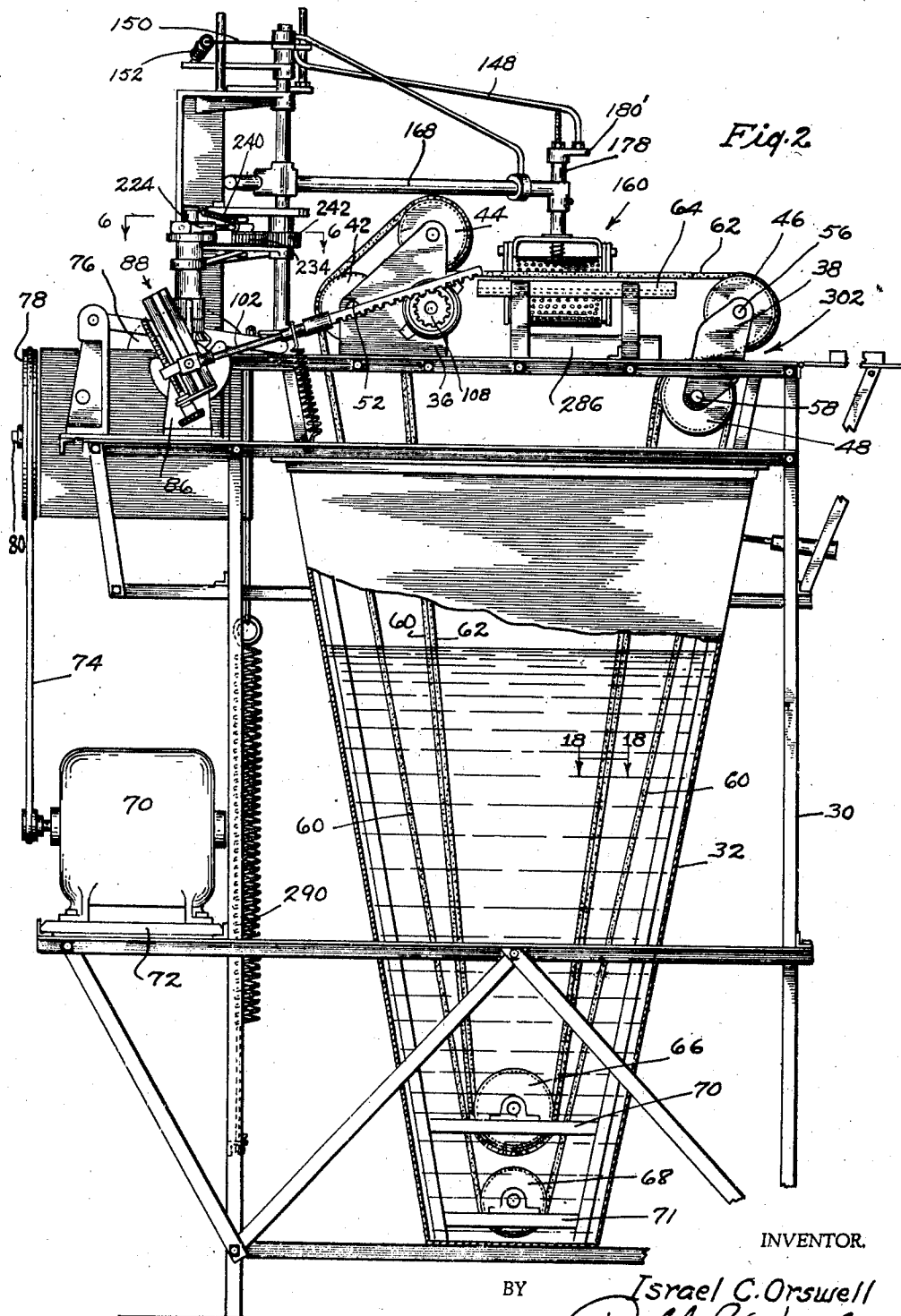
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DECALCOMANIA TRANSFERING MACHINE

Filed May 6, 1940

10 Sheets-Sheet 2



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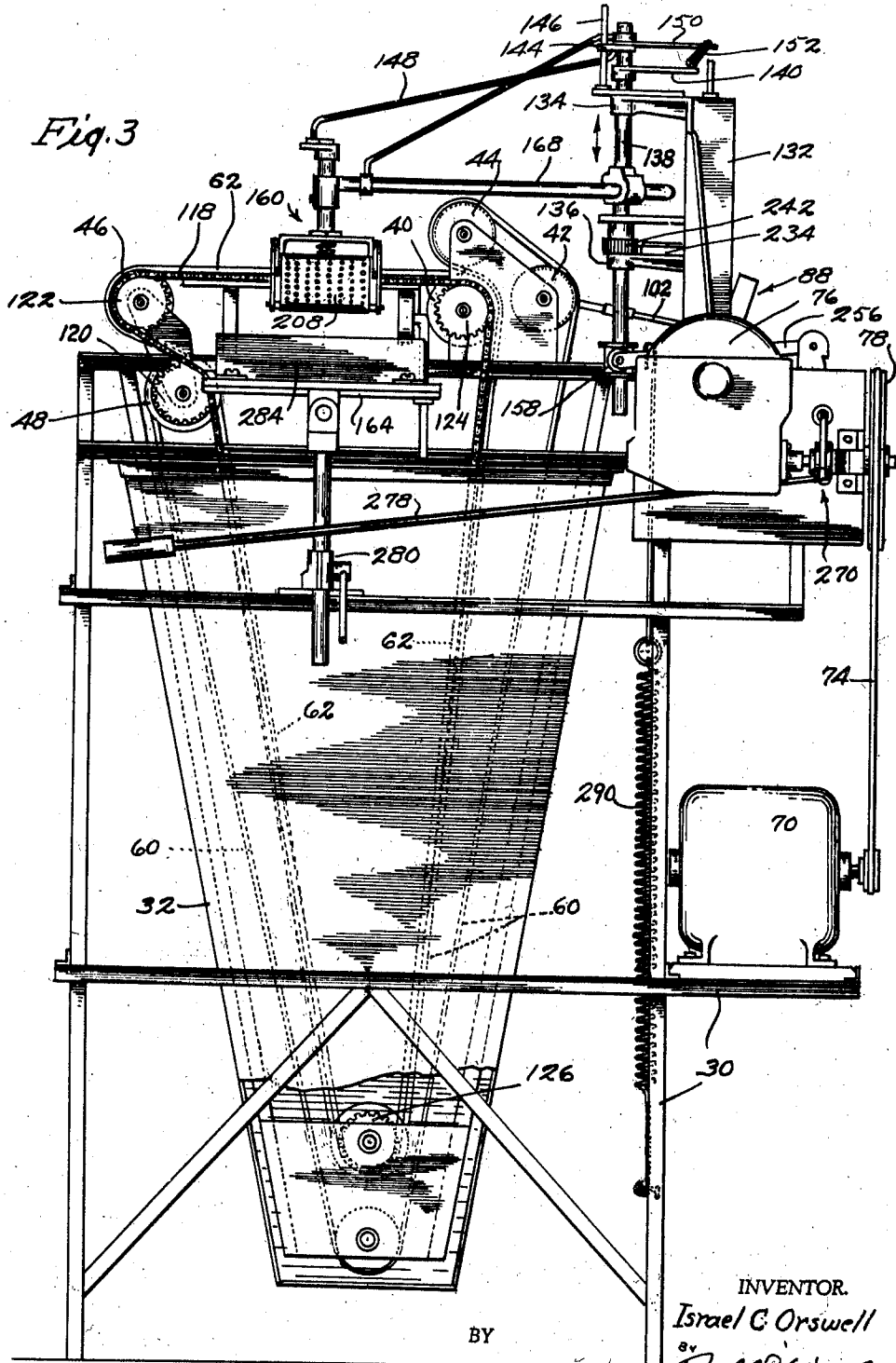
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DECALCOMANIA TRANSFERING MACHINE

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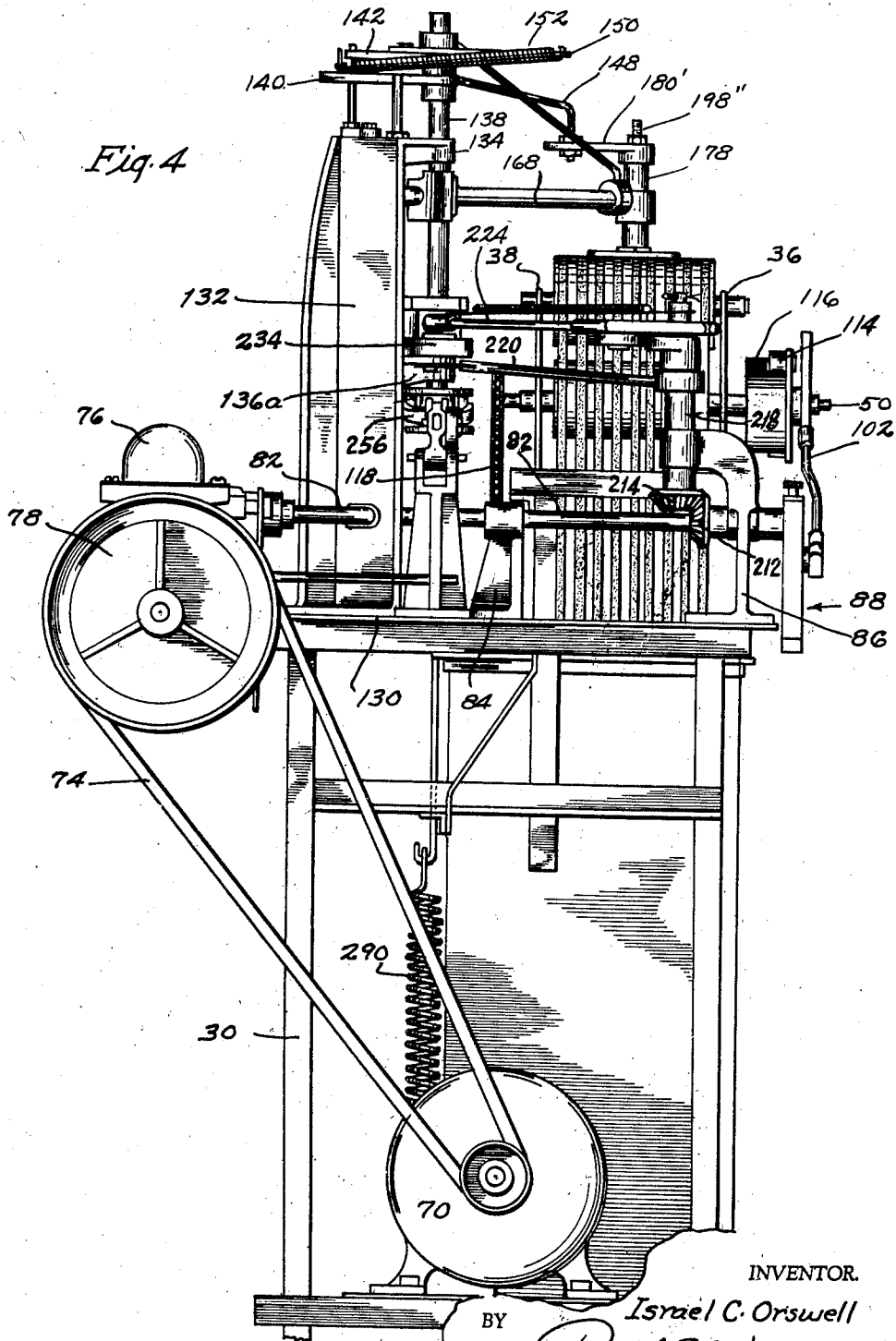
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DECALCOMANIA TRANSFERRING MACHINE

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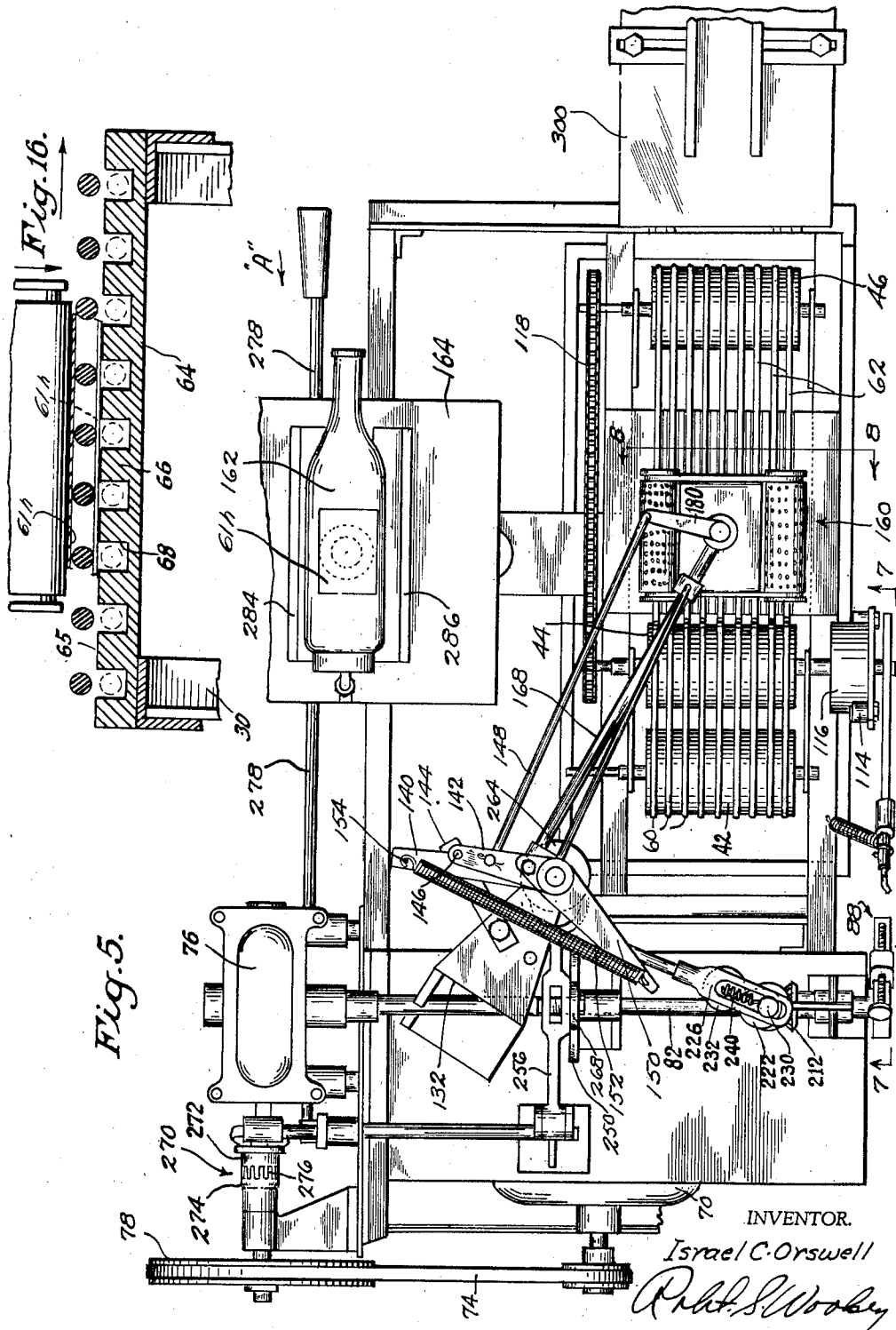
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DECALCOMANIA TRANSFERING MACHINE

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10 Sheets-Sheet 5



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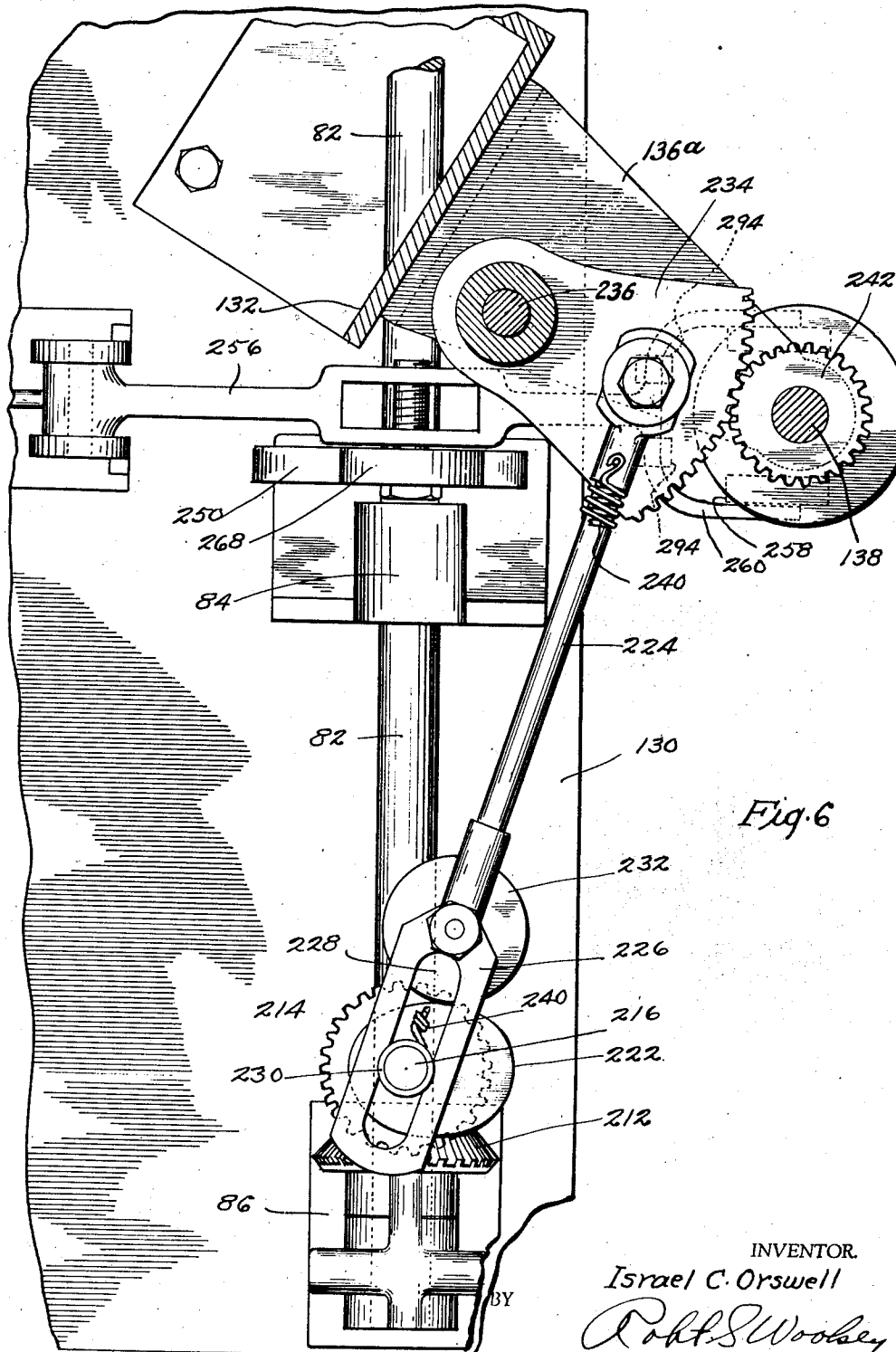
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DECALCOMANIA TRANSFERRING MACHINE

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10 Sheets-Sheet 6



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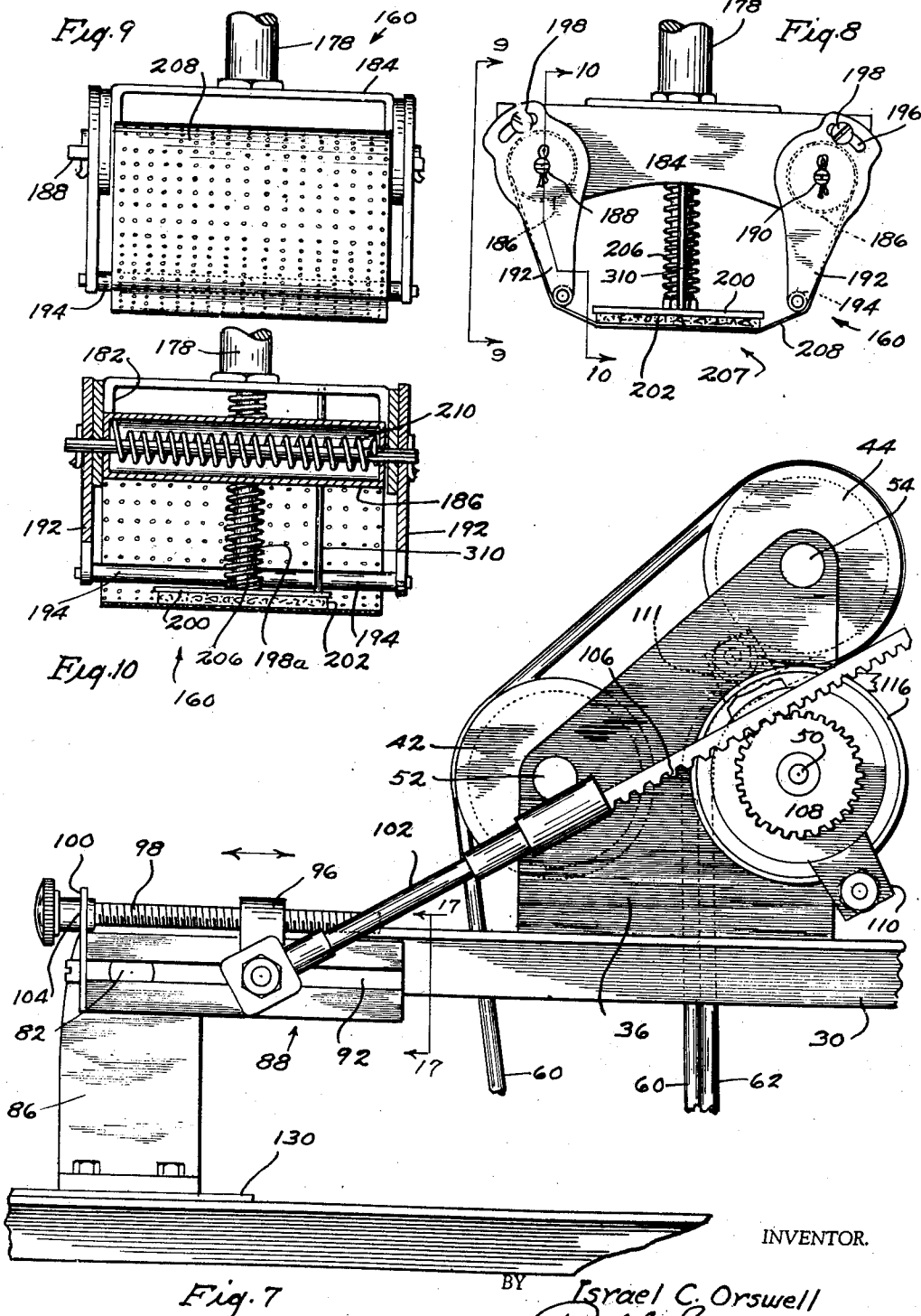
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DECALCOMANIA TRANSFERRING MACHINE

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10 Sheets-Sheet 7



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DECALCOMANIA TRANSFERING MACHINE

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10 Sheets-Sheet 8

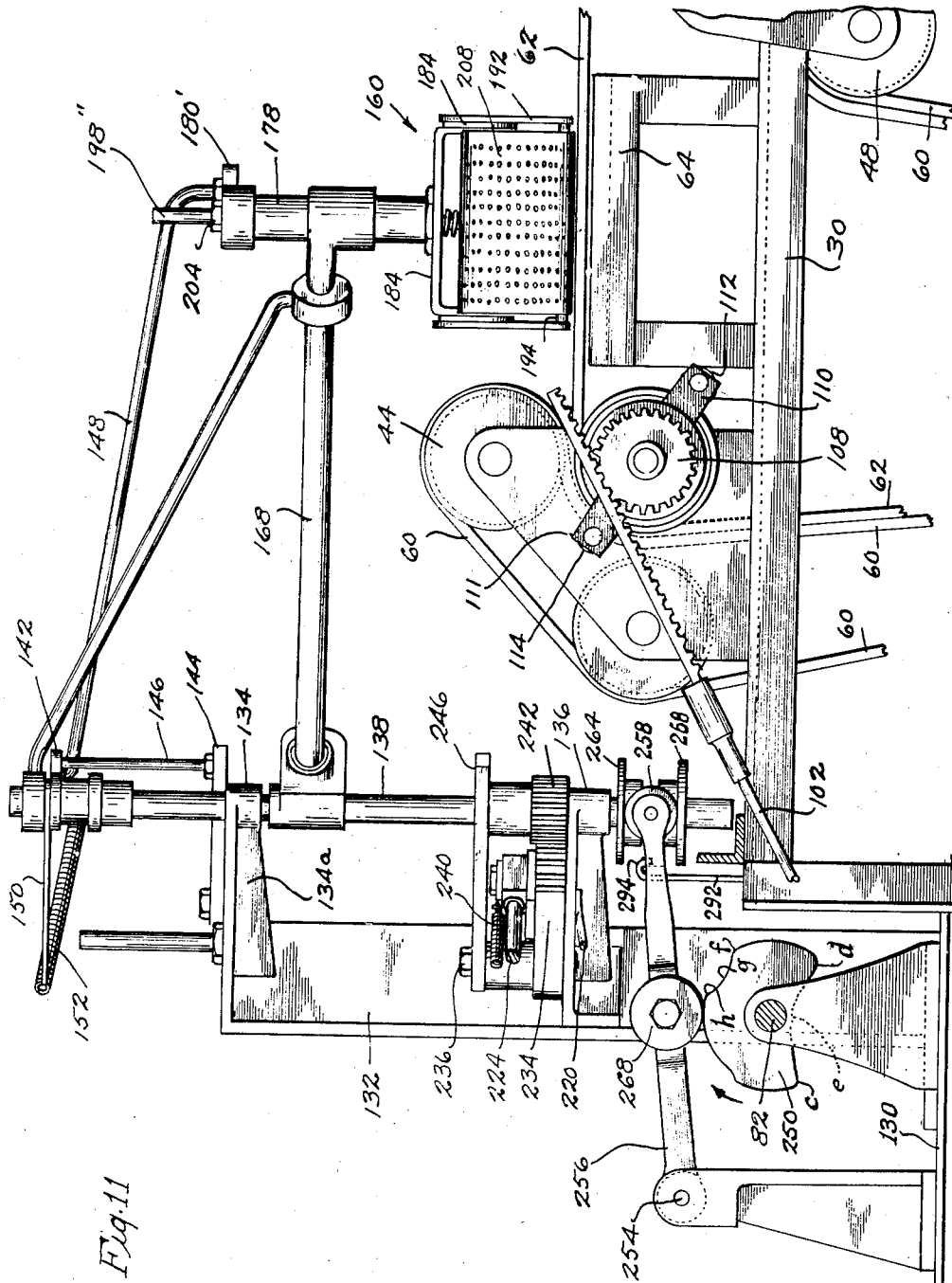


Fig. 11

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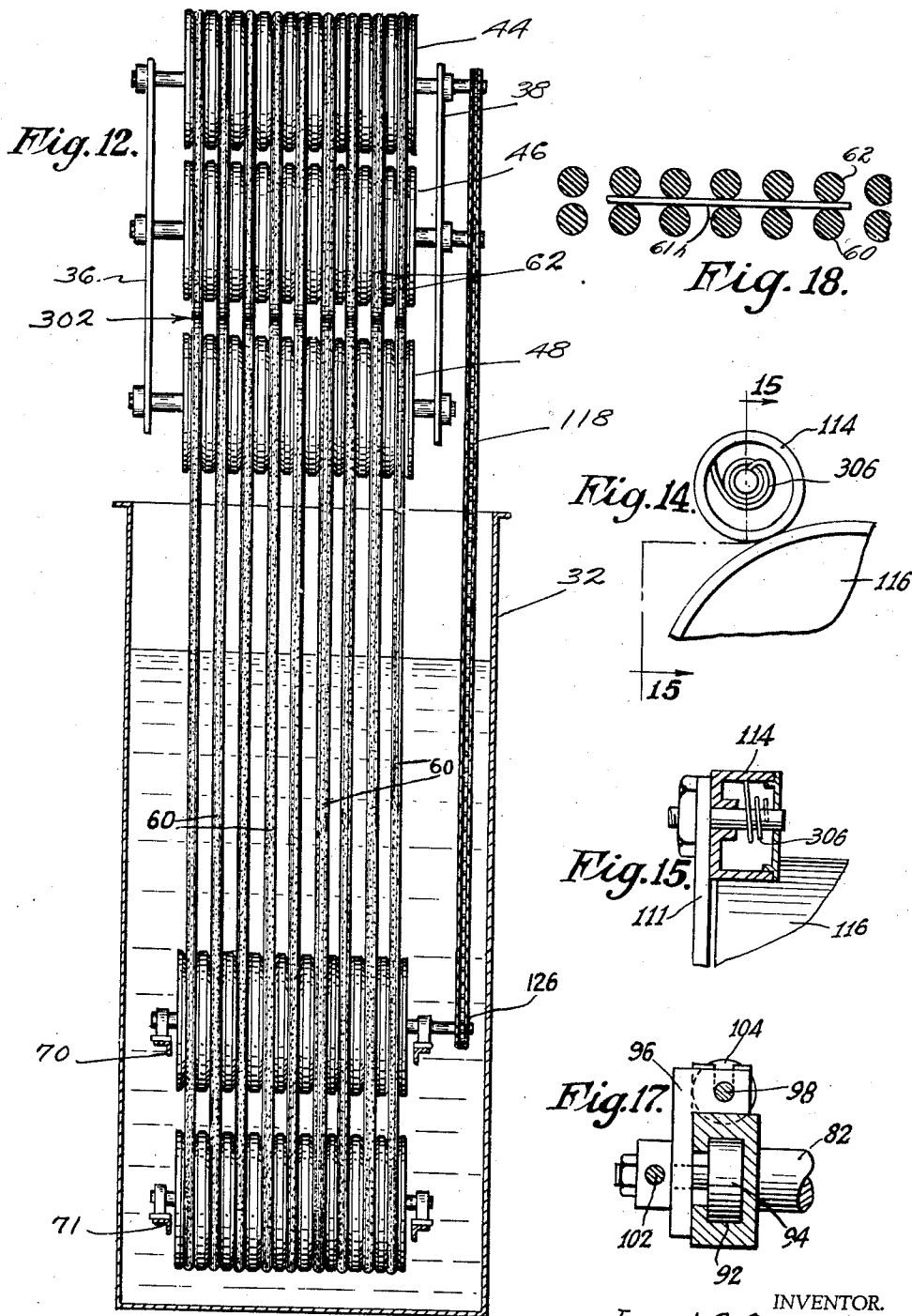
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DECALCOMANIA TRANSFERRING MACHINE

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10 Sheets-Sheet 9



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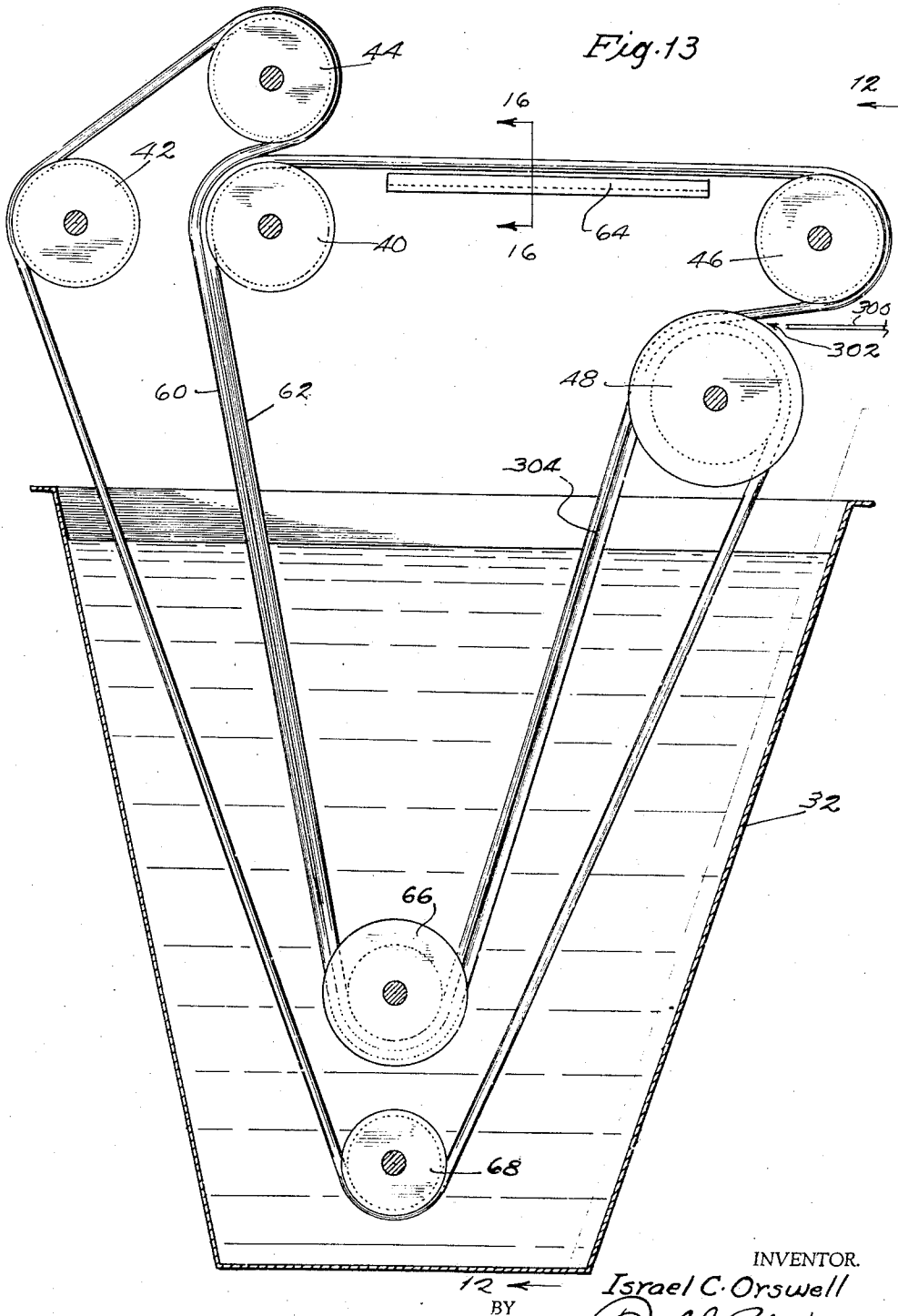
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DECALCOMANIA TRANSFERING MACHINE

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10 Sheets-Sheet 10



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DECALCOMANIA TRANSFERRING MACHINE

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Application May 6, 1940, Serial No. 333,558

21 Claims. (Cl. 41—1)

The machine of this invention is intended to operate or function in such manner as to effect the transposition of a decalcomania from its backing to an object to be decorated by the decalcomania.

Briefly stated, a decalcomania is a pictorial or other representation builded up by layer on layer of color. Each succeeding color being superposed upon the first as to develop harmony and composition. Usually the colors so builded up, rest upon a water soluble gum coated upon a strip or sheet of paper which forms the vehicle for moving the representation after its creation. Decalcomanias are formed of pigments having different characteristics, that is, some decalcomanias are formed of pigments which are fusible when subjected to heat, hence when a decalcomania is transferred to a vitreous surface and is then fused thereto, the pigments must naturally have a lower fusing point than the surface to which or upon which it is to be fused.

Accordingly it is a prime object of the present invention to provide a machine which will transfer a decalcomania from its backing to an object adapted to receive the same, either for the purpose of simple adhesion thereto or for the purpose of being fused thereto by the subsequent application of heat.

Another object of the invention is to provide a machine in which the decalcomania is removed from its backing by the application of pressure contact thereon, and by subsequently applying a laterally directed pressure to slip the decalcomania from its backing.

A further object of the invention is to provide in a decalcomania transferring machine, means to support a wetted decalcomania upon a resilient surface which is movable in a horizontal plane and then to apply a downward pressure upon the decalcomania whereby a transferring head is brought into firm contact therewith, and subsequently operating means based upon a lateral motion to remove the decalcomania from its backing and apply the same upon a receiver.

A still further object of the invention is to provide a decalcomania transferring machine in which a decalcomania is first wetted and is then subjected to downward pressure and then subsequently applied lateral pressure in order to remove a decalcomania from its backing for affixation to a receiver.

A still further object of the invention is to provide a machine to transfer a decalcomania in which a swingable head is brought into contact with the decalcomania and which is then

swung laterally to slip a decalcomania from its backing for affixation upon a receiver.

A still further object of the invention is to provide means to impregnate a decalcomania support with water to loosen or soften the gum base thereon, said means comprising a continuously varying hydrostatic pressure applicable thereto.

Another object of the invention is to provide an intermittently operated means to conduct a decalcomania and its base support through a water bath wherein a constantly varying hydrostatic pressure from immersion to emergence therefrom is adapted to facilitate softening of the gum base used to secure the decalcomania upon its backing, whereby the decalcomania can be readily removed from the said base.

Still another object of the invention is to provide in a transfer machine of the character contemplated, a head construction for transferring decalcomanias and the like, which includes a plane and horizontal transfer contacting surface so formed and arranged as to be deformable within limits, whereby a decalcomania can be affixed upon a concave and/or convex surface with equal facility as upon a plane surface.

Other objects, and/or features, and/or advantages of the invention may appear from the accompanying drawings, the specification, and appended claims.

In the drawings of which there are ten sheets:

Figure 1 is a front elevation of the machine of this invention showing construction thereof.

Figure 2 is an elevation of the left side of the machine of this invention based upon the illustration shown in Figure 1.

Figure 3 is a view in elevation showing the machine from a point opposite that shown in Figure 2.

Figure 4 is a view in elevation showing the rear of the machine, in this figure a somewhat larger scale has been used in drafting the same for the purpose of clarity.

Figure 5 is a plan view of the machine of this invention.

Figure 6 is a detail taken substantially on line 6—6, in Figure 2, showing the means used to obtain lateral movement of the arm used to operate and support the transfer head, the same being drawn at substantially full scale.

Figure 7 is a detail taken substantially on line 7—7 in Figure 5, showing the means used to obtain a periodic and variable movement of belts used to carry a decalcomania into a tank of water

and to subsequently deliver the same for removal from its paper backing by the transfer head.

Figure 8 is a detail of the transfer head, the same being taken substantially on line 8—8, in Figure 5, deleting other adjacent structure.

Figure 9 is a side elevation of the head shown in Figure 8, the same being taken along line 9—9, therein.

Figure 10 is a sectional view in elevation showing construction of the head, the view is taken substantially on line 10—10, Figure 8.

Figure 11 is a somewhat enlarged detail showing mechanism used to operate the machine, and showing in particular the means used to raise and lower the transfer head, the means in relation thereto, to obtain driven movement of the belts, and showing the relation of the head to the delivery belts just prior to moving into contact with a decalcomania resting thereon. The cam means used to obtain lateral movement of the head supporting arm, has been deleted to more clearly show structure which lies in the rear thereof as viewed in this illustration.

Figure 12 is a view in elevation showing the multiple belts used to convey a decalcomania from a source of supply down through a deep tank to wet the decalcomanias, and to return them to a line for removal by the head shown in the other figures of the drawings, the view is largely schematic, and is taken substantially on line 12—12, in Figure 13.

Figure 13 is a side view showing schematically the belt system used to convey a decalcomania for the purpose of this invention.

Figure 14 is a side-elevation of one of the over-riding cams adapted to permit one-way movement of the feed for integrated movement of the belts.

Figure 15 is a sectional view of the cam shown in Figure 14, the same being viewed substantially along line 15—15, Figure 14.

Figure 16 is a sectional elevation taken substantially on line 16—16, in Figure 13, showing construction of the table over and through the grooves of which the belts move during the interval that the transfer head is brought into contact with the belts to pick-up the decalcomania, however, during such contact the belts are stationary, being merely depressed into the grooves so that the decalcomania rests unyieldingly upon the table for action by the transfer head.

Figure 17 is a detail taken substantially on line 17—17 in Figure 7 showing construction not readily apparent in Figure 7 of the means used to obtain variable periodic movement of the belts and decalcomania through a water tank for the purpose of wetting a decalcomania.

Figure 18 is a fragmental detail taken substantially on line 18—18, Figure 2, showing a decalcomania positioned between the belts employed in the machine of this invention.

The machine of this invention, may for the purpose of particularizing, be stated to be formed of three divisions which are so co-related in function and service to the other that they form an entity for the purpose of wetting a decalcomania and then delivering the same to definite point for the purpose of transferring the decalcomania from its backing to some object suitable therefor and intended to be decorated by the decalcomania.

In the following specification, detailed reference will be made to the several aforementioned divisions of the machine, and to that end, the

means used to wet and thereby soften the gum base of a decalcomania will be first taken up.

Reference to the drawings will show that a suitable frame 30 is adapted not only to support the machine as a whole, but also a tank 32 cradled therein. As shown the tank is formed with considerable depth so that a decalcomania 61h which is immersed therein and is then moved to a point adjacent the bottom, is subjected to increasing hydro-static pressure, which fact facilitates and shortens the period of necessary immersion to thoroughly saturate the decalcomania backing and the gum base upon which the decalcomania proper rests. Rails 34 of the frame are adapted to support frames 36 and 38 within which a plural number of grooved wheels 40, 42, 44, 46, and 48 are adapted to rotate upon their respective shafts 50, 52, 54, 56, and 58. It will be recognized that grooved drums could be used instead of the several wheels aforementioned and the same result would be had, for it will be seen that the purpose of the wheels is to provide means to guide the belts 60 and 62 through a definite course from adjacent a point of decalcomania supply, downwardly through the tank, and finally to a delivery point which is co-incidental with a central spot upon the table 64 which is also secured upon the rail 34.

Deep within the tank 32, I position wheels or grooved drums 66 and 68 which are mounted for rotation upon a suitable support 70 and 71. These wheels co-operate with the aforementioned ones in guiding the belts 60 and 62 through the tank 32.

Reference to Figure 12 will show that the belts 60 and 62 are respectively formed of a plural number of individual strands which are slightly spaced apart and of which there may be any desirable number. In the present instance there are nine strands or sub-belts in each of the major belts or belt groups 60 and 62. The purpose of this arrangement is to expose as much of the surface of a decalcomania backing as possible to the wetting action of water within the tank 32, and yet provide such a degree of support as to enable the decalcomania to be carried with stability and without marring the same. Reference to the several figures of the drawings, and in particular to Figure 16, will show that the table 64 is provided with a number of grooves in its top surface, there being one groove for each of the strands or sub-belts of belt 62, for this is the belt which moves over the table. The grooves are adapted to receive the sub-belts when the same are pressed downwardly in a manner to be subsequently shown, so that when thus pressed downwardly, the decalcomania will rest upon the top surface 65 of each of the dividing strips 66 between grooves 68.

A motor 70 mounted upon a base 72, and operating through a belt 74 and a standard gear ratio reduction device 76, including a pulley 78 and shaft 80, is adapted to drive a shaft 82 by means of which all of the mechanism of this machine is driven.

The shaft 82 is journaled in bearings 84 and 86, and is provided with an adjustable eccentric 88 upon the outer end thereof as shown in particular in Figure 7. The eccentric 88 comprises a rectangular block 90 fixedly secured upon the shaft 82 so as to rotate therewith, and is formed with a groove 92 extending the length thereof for reception of a slide 94 which operating within the confines of the groove, is adapted to hold a saddle 96 upon the exterior of the eccentric

88. A thumb actuated screw 98 held against longitudinal movement by plate 100, is adapted to move the saddle 96 with respect to axial alignment with the shaft 82, thereby enabling the saddle 96 and a pitman rod 102 to be moved through an adjustable arc. The free end of the plate 100 is bifurcated and the prongs thereof operate in a groove 104 of the screw 98. This construction is both simple and practical, and is well adapted to hold the screw against longitudinal movement, and hence when it is rotated the saddle 96 is moved relative to the axis of the crank 88.

The outer end of the pitman rod 102 is formed as a rack, having teeth 106 which are in mesh with the teeth of gear 108 which is free running upon the shaft 50. However, the gear 108 is provided upon its one side with arms 110 and 111 upon which are carried eccentric rollers 112 and 114. A wheel 116 is fixedly secured upon the shaft 50 so as to drive the shaft when the wheel is turned, and such rotation is effected when the gear 108 and the arms 110-111 are moved in response to pressure by the pitman rod 102, for the reason that the rollers 112 and 114 are set with respect to the periphery of the wheel 116 so as to bite or be pinched between the surface thereof and the axis of the rollers when moved in one direction, while being free to ride over the surface of the wheel when moved in an opposite direction.

A chain 118 operating circuitously over gears 120, 122, 124, and 126 is adapted to drive the shafts upon which they are mounted so as to impart synchronous motion to each of the afore-mentioned belt carrying wheels, and the whole of this motion, which is intermittent is obtained by the movement of the pitman rod 102 and its co-related accessories.

The frame 34 carries a bed-plate 130 upon which the bearings 84 and 86 are mounted, and also carries a bracket 132 upon which I secure bearings 134 and 136 which journal an oscillatable shaft 138 vertically positioned therein. The upper end of the shaft 138 extends through the bearing 134 and is provided with a radially disposed arm 140 fixedly secured thereto for synchronous movement. Super-posed or positioned above the arm 140, I secure a second radially positioned arm 142 which is loosely positioned upon the shaft 138 whereby the shaft may be oscillated without effecting rotational effort in the arm. The bearing bracket 134a is provided with a bar 144 fixed thereto, and upon the free end of which a pin 146 is secured for the purpose of forming a stop against excessive movement of the arm 140 and the shaft 138. The arm 142 not only gives the pin 146 stability, but provides an anchorage for a radius rod 148, the use of which will be subsequently set forth. Just above the arm 142 and extending substantially oppositely therefrom, I place a third arm 150, and this arm has attached to its free end, a spring 152 the opposite end of which is attached to small pin 154, and since the arm 150 is fixedly secured to the shaft 138 the spring 152 operates to place the arm 140 and shaft 138 under a constant pressure which in co-operation with a positive drive to be later described, holds the transfer head assembly 160 centrally positioned over a container or receptacle 162 upon the table-like support 164, because pin 166 secured in the bearing bracket 134a forms a definite stop.

An arm 168 is clamped to the shaft 138 at point 170 while the opposite end of the arm 168

carries the aforementioned transfer-head assembly 160. A collar 172 upon the arm 168 forms an attachment for a brace member 174, the other end of which is secured to a collar 176 upon the upper end of the shaft 138. This arrangement or a similar construction adds stability to the arm 168.

The free end of the arm 168 is provided with a tubular member 178 which extends a short distance above and below the axis of the arm 168. Upon the upper end of the member 178, I secure a short lever 180' in fixed relation thereto, and this lever is adapted to receive the otherwise free end of the radius rod 148, thus assuring that the transfer head 160 will be in proper functional alignment when swung arcuately to pick up and then deposit a decalcomania.

The transfer-head 160 is secured upon the lower end of the member 178 and comprises a horizontally disposed plate 180 in threaded or other connection to the member 178, and is formed with dependent sides or flanges 182, upon which are secured elongated members 184, the outer end of which form journals for rollers 186 positioned between the members 184. These rollers are tubular and are mounted upon pins 188 and 190 which are journaled in the members 184 as above mentioned. The ends of the pins 188 and 190, which project through the sides of the members 184, are adapted to carry fingers 192 arranged in pairs, and the lower ends of these pairs of fingers are joined by rollers 194, while the other ends of the fingers are each provided with a slot 196 whereby the fingers are permitted a degree of movement, being limited therein because of screws 198 extending through the slots and being fixedly secured in the walls or sides of members 184.

Axially aligned within the member 178, I place a threaded stem 198'' upon the lower end of which is secured a small rectangular plate 200 and upon this plate I place a sponge rubber or other resilient pad 202. The upper end of the stem 198'' is provided with a nut 204 in face contact with the lever 180' whereby upon turning the nut 204 the stem will be drawn upwardly or if loosened will be forced downwardly by the action of an extensible spring 206 which encircles the stem 198'' and which is in abutment with the plate 200 on one hand and an immovable shoulder within the member 178. A perforated belt 208 is secured around each of the rollers 136 and extending downwardly passes over each of the rollers 194 and also across the intervening space including face contact with the pad 202. An extensible spring 210 encircles each of the pins 188 and 190, and has its one end secured to the inner surface of the cylinder 186, while the other end of the spring is situated within a slot formed in the pins 188 and 190, thereby placing the cylinders under rotational tension to ensure that the belt 208 will always be taut.

For the purpose of function it is necessary that the shaft 138 be made to oscillate and also provide it with a raising and lowering motion.

Reference to Figures 4 and 6 among others of the drawings will show that the shaft 82 is provided with a bevel gear 212 which is in mesh with a second and like gear 214 which is secured upon a shaft 216 operating within a sleeve 218 formed as an extension of the bearing block 86. A brace 220 secured to the sleeve 218 and to the bearing bracket 136a, gives stability to the sleeve 218 and the shaft 216 operating therein.

A cam 222 is secured upon the upper end of the

shaft 216 and is adapted to rotate therewith, while immediately above the cam I place a rod 224 having a flared end 226 within which is formed a slot 228 so proportioned as to snugly receive the upper and free end of the shaft 216. A boss 230 pinned to the extreme upper end of the shaft 216 is adapted to hold the rod 224 in contact with the cam and to prevent dislocation thereof. An idler wheel 232 is mounted upon the rod 224 and is in contact with the cam 222 so that rotation of the cam will cause simultaneous movement of the rod 224 which is also connected in pivotal manner with an arcuately movable rack 234 which is fulcrumed upon a bolt 236 in the bearing bracket 136a. An extensile spring 240 secured at its one end to the shaft 216 or rather to the base 230 and at its other end to the rod 224 is adapted to exert a pull upon the rod 224 and the rack 234 whereby the same will be caused to oscillate in response to release of pressure by the cam 222.

The rack 234 is in mesh with a gear 242 which is adapted to rotate or oscillate the shaft 138 because of a keyed relationship operating in a spline 244 formed in the shaft 138. It is to be noted that the gear 242 rests upon the upper face of the bearing bracket 136a and is held in this position by means of a bar 246 which at its one end encircles the shaft 138 while its other end is held in fixed position by means of the bolt 236. The just described apparatus will oscillate the arm 168 and the transfer head 160. Apparatus necessary to lift the shaft 138 and associated parts will now be described.

The shaft 82 is provided with a cam 250 formed with certain lifting faces, the uses of which will be described in the description of operation. A bearing bracket 252 is mounted upon the base 130, and a pin 254 therein forms a fulcrum point for a lever 256, the other end of which is bifurcated, as partially shown in dotted lines in Figure 6, and carries rollers 258 upon the inner sides of the arms 260 and 262 formed by the bifurcation. These rollers rest between the faces of collars 264 and 268 which are positioned upon the shaft 138, while an anti-friction roller 268 is pivotally mounted upon the lever 256 in medial vertical alignment with a plane passing through the shaft 82, and since the roller 268 rests directly upon the top side of the cam 250, it accordingly constitutes the sole support for the shaft 138 and associated elements, hence any movement imparted to the lever 256 by the cam 250 will cause the shaft 138 to raise or will permit gravitational lowering thereof.

Reference has previously been made to the power drive used to effect operation of the machine of this invention. In order that operation of the machine may be controlled, I provide a clutch 270 comprising a driven element 272 and a driving element 274 which are joinable upon meshing of teeth 276 which are adapted to be separably dove-tailed when the driven element 272 is forced into engagement with the driving element 274 upon an inward thrust of the manually operated rod 278, as shown in Figure 5.

The table 164 is vertically adjustable by means of a clamp 280 secured upon the frame 30 of the machine, and is adapted to support a decalcomania receiving object 162 in vertical adjustability with respect to the head 160. The object 162 being centered between aligning supports 284 and 286.

Reference has previously been made to the fact that the weight of the shaft and its associated

parts, rest upon the cam 250 by means of lever 256. The several figures of the drawings will show that such gravitational effort is augmented by means of a spring 290, the one end of which is held in fixed relation to the frame 30, while the other end is secured to a metal strap 292 or equivalent device having an over-hanging portion 294 which engage the shoulders of the aforementioned bifurcated lever 256 and thereby exert a downward pressure proportional to the distention of and strength of the spring 290.

Operation of the machine of this invention will be described in the following statement.

Assuming of course that the machine is in good working order, that a supply of decalcomanias rest upon the table 300, and that the tank 32 is filled to a substantial depth with water, and that the motor 70 is idly rotating the pulley wheel 78 (the clutch 270 being disengaged). Upon forcing the clutch control rod 278 inwardly in the direction of the arrow A, the clutch 270 is engaged and operating through the gear-ratio reduction device 76, drives shaft 82 and its crank 88, pitman-rod 102 and the rack 106, which being in mesh with the gear 108 forces the same in a clockwise direction and carrying the arms 110 therewith, causes the eccentric rollers 112 and 114 to be forced into pressure contact with the wheel 116 thereby driving the shaft 50 and causing the belts 60 and 62 to travel over each of the several wheels or grooved cylinders 40, 42, 44, 46, 48, 66, and 68. Decalcomanias are now fed from the supply upon table 300 to enter between and carried by the belts 60 and 62 beginning at point 302 between wheels 46 and 48. Continued belt travel carries the decalcomanias progressively deeper in the tank of water 32, see Figure 18, and readily saturates them by reason of pressure due to hydro-static head.

Heavy lines 304 in Figure 13 indicate the course of travel of the decalcomanias and also the manner in which they are held between the belts. This movement is intermittent due to the backward sweep of the pitman-rod which is permitted for the reason that in so moving the eccentric rollers 112 and 114 are free to be drawn over the surface of the wheel 116. It may be here stated that each of the eccentric rollers in the instant illustration are spring actuated by means of the springs 306 to hold the greater axis thereof in face contact with the wheel 116 thereby acting as a spur to effect one-way movement thereof.

The machine is so timed as to cause a decalcomania to be delivered at a spot on the table 64 or immediately thereabove, for the decalcomanias now reset upon the taut belt 62, which is in alignment with the medial vertical center of the transfer head 160 and when so placed the whole of the belt system comes to rest pending completion of removal of the decalcomania from its paper or other backing or support.

Assuming that the head 160 is spotted over the table 164 as shown in Figure 2, it will be noted that the cam 250 on shaft 82 is positioned with its concave face c-d so positioned as to permit the roller 268 and lever 256 to be at their lowest point and accordingly permitting the shaft 138 and the head 160 to likewise be in their lower most position. Movement of the shaft 82 rotates the cam 250 and in so doing cam face d-e pressing upwardly upon the roller 268, causing it and its lever 256, the shaft 138 and the head 160 to be raised to a plane which is just above the belt 62 and the decalcomania thereon and this position

of elevation is held by the face $d-f$ of cam 250, being defined by a constant radius from the shaft 82.

From the moment that cam face $d-f$ becomes operable, a second force is brought into action, that is, the shaft 216 driven by gears 212 and 214 causes cam 222 to rotate and to force the roller 232 and the rod 224 to move toward shaft 138, this movement causes the rack 234 in meshed relation to gear 242 to move the shaft clock-wise and of course swings the arm 168 laterally until it reaches a point in medial vertical alignment with the decalcomania resting upon the momentarily halted belt 62. During this interval the spring 240 is placed under an increasing degree of tension and hence gives stability to the head 160 in its poised position over the table 64 by taking any possible back-lash out of the just mentioned gear 242 and rack 234.

Continued rotation of the cam 250 will bring the face $f-g$ into play and at this time the roller 268 drops slightly permitting the head 160 and associated supporting elements to also drop slightly. This movement causes the decalcomania contacting surface 207 to press upon the decalcomania and the belt which supports the same, pressing downwardly until the belt 62 (each group of belt strands being considered to constitute a belt) has been forced within the grooves of the table 64, in which there is one groove for each of the strands constituting a belt. Thus it will appear that the decalcomania will be forced into contact with the surface 65 (upper) of the dividing strips between the grooves. Firm contact between the belt surface area 207 and the decalcomania expels air and moisture thereby raising the degree of surface tension between these elements to a point sufficiently great to cause the decalcomania to adhere to the surface area 207 of the head. It may be here noted that the sponge rubber pad 200 together with the yieldable pressure of the spring 206 effects the aforementioned pressure upon the decalcomania rather than a precise mechanical movement of the parts concerned.

The sponge rubber pad 202 and the plate 200 to which the pad is secured are given lateral stability by means of a guide rod 310 the upper end of which is free to move through an opening in the plate 180 when firm pressure is placed upon a decalcomania. Naturally the apparent length of the stem 198" is fore-shortened, that is, the pad area 207 is moved closer to the plate 180 when pressure is placed upon it and this condition would cause the perforated belt 208 to become loose if it were not for the fact that the rollers 186, to which the ends of the belt 208 are secured, are under constant tension of spring 210 and hence wind-up any slack that may develop in the belt 208.

Continued movement of the cam 250 causes cam face $g-h$ to lift the head 160 and associated parts so that the head lifts from a point at which the belt 62 is under pressure thereby and the point of head elevation thereby attained is held during the interval that the cam 222 moves from maximum throw to minimum throw. However, as pressure of the cam 222 is eased, the spring 240 forces the rack 234 to return toward its point of beginning and therefore reverses the previous movement of shaft 138, arm 168, and head 160 and in so doing causes the head to move laterally to point in vertical alignment with its point of beginning. As cam face $c-e$ passes under the roller 268, the shaft and associated parts includ-

ing the head are moved downwardly under the combined influences of gravity and the urging of the distended spring 290 thereby bringing the pad area 107 with the decalcomania thereon into firm contact with the surface of a bottle or other object 162.

After completion of the transfer-head lift effected by operation of cam surface $g-h$, it is to be noted that the decalcomania adhering to the area 207 is slid by lateral movement from the paper backing which previously supported it, and this movement is accomplished by reason of the fact that adhesion to the area 207 is of greater tenacity than that offered by the largely dissolved gum previously used to hold the decalcomania to its backing, for when wet and in fact partially dissolved, the gum in effect offers a vehicle to expedite lateral movement of the decalcomania, for in being slid laterally natural air pressure upon the parts is of no concern, for in this case conditions of air pressure are not being disturbed, as would be the case if the decalcomania were moved upwardly or lifted from its backing.

After being brought into physical contact with the bottle 162, the resiliency previously noted in the parts immediately associated with the contact area 207, is again brought into play for it is now necessary that the pad area 207 give up the decalcomania it has carried and that the same be deposited upon the bottle. With the table 164 placed in properly adjusted height in relation to the head 160 considering the ware to be decorated by the decalcomania, contact by the pad 202 upon the object 162 will place the decalcomania thereon, first in gentle contact or pressure and then with increasing pressure as the object 162 gradually displaces normal extended position of the pad 202, for previously stated the pad is accommodated in relative upward movement by the movable stem 198" although such movement is resisted by the spring 206 and thereby forces the pad and belt 208 into such firm contact with the object 162 as to cause the same to literally mould itself to the contour of the object 162.

The fact that the pad 202 under pressure of the spring 206 follows the contour of the object 162 is of great value and convenience for it enables decalcomanias to be affixed to objects having a frosted or etched type of surface, and including surfaces which carry raised letters or other indicia, and including surfaces which are either concave and/or convex, or concavo-convex when viewed in the same plane or as an undulating surface. Naturally the above mentioned types of contour must be within limits otherwise a pad having modified characteristics would have to be employed, but otherwise the application would not be disturbed in principle or in fact.

Upward movement of the head is accomplished as mentioned in the beginning of this description, and because of the fact that the decalcomania still has a small quantity of gum adhering thereto, and because the pad and belt 208 progressively fold a decalcomania arcuately over a convex surface (the most usual type) all air is naturally expelled from between the decalcomania and the surface to which it is affixed, thereby firmly securing the same in position. Lifting of the pad area 207 does not disturb the decalcomania for by the time spring and pad pressure is eased, air will flow between the parts concerned and entering through the minute apertures in the belt 208 will destroy any vacuum created by the closely related surface relations

between the belt and decalcomania previously existing.

Upon partially lifting the head 160, the control rod 278 may be pulled outwardly to disconnect the clutch 270 thereby bringing the machine to rest pending other and like operations.

It is believed that from the foregoing description it will be clearly apparent that I have provided a simple, easily used and novel decalcomania and/or label transferring machine, however;

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 adapted to transfer decalcomanias from a gum base upon a support to an object, means to wet said gum whereby the base formed thereby is largely dissolved, means to deliver the decalcomania after wetting to a transfer point, a transfer head having a retractable and padded decalcomania contacting face, and means operable to effect union between said transfer head and a decalcomania to develop surface tension and means subsequently operable whereby said head is moved laterally to slip the decalcomania from its gum base and to affix the same upon an object.

2. In a machine to remove decalcomanias from a gum base upon a paper support, means to wet said gum whereby adhesive qualities thereof are lessened, said means being operable to deliver the decalcomania at a given place in yieldable suspension over a table structure, a laterally swingable head having a retractable and padded surface adapted to be brought into surface union with said decalcomania, said head being operable whereby it presses downwardly upon the decalcomania until a firm surface contact between the parts concerned is effected, whereby natural surface tension is of greater force than the lessened adhesive qualities of the wetted gum thereby enabling the decalcomania to be slipped from its gum base by lateral pressure when said head is correspondingly moved.

3. In a machine adapted to transfer a decalcomania from a gum base upon a support to an object, means to wet said gum whereby the base formed thereof is largely dissolved, means to deliver the decalcomania after wetting to a transfer point, a transfer-head having an inwardly yieldable face adapted to be brought into surface contact with a decalcomania, means operable to effect union between said transfer-head face and the decalcomania whereby surface tension of greater tenacity than the tenacity of the adhesive qualities of the remaining gum is developed to enable the decalcomania to be slipped from its gum base upon application of lateral pressure to said head and to remain in adherence to said face, and means to affix the removed decalcomania upon an object, said means including a flat and padded backing for said face whereby the decalcomania may be forced into adherence to a plane surface upon bringing said head into contact with said surface.

4. In a machine adapted to transfer a wetted decalcomania from a gum base upon a support to a convexed surfaced object, means to deliver the

decalcomania after wetting to a transfer point, a transfer-head having a yieldable and padded face adapted to be brought into surface contact with a decalcomania, pressure means operable to effect firm contact between said transfer-head face and the decalcomania to exclude air whereby a surface tension of greater tenacity than the tenacity of the softened gum is developed to enable the decalcomania to be slipped from its base, means to apply lateral pressure to said head to move the same to a point at which the decalcomania may be applied to said object.

5. In a machine adapted to transfer a decalcomania from a water soluble gum base upon a support to an object, means to deliver the decalcomania after being wetted to a transfer point, a transfer-head having a yieldable face adapted to be brought into surface contact with a decalcomania, means to move the transfer-head relative to the decalcomania, pressure means operable to effect contact between said transfer-head face and the decalcomania whereby surface tension of greater tenacity than the tenacity of the softened gum is developed to enable the decalcomania to be slipped from its base upon application of lateral movement in said head, said transfer-head including a pressure plate provided with a cushioned undersurface thereof, said cushion and transfer-head face being adapted to embrace the contour of the object receiving the decalcomania upon application of pressure of the plate and transfer-head whereby the decalcomania is firmly pressed upon the said object.

6. In a machine adapted to transfer decalcomanias from a water soluble gum base upon a paper backing to an object adapted to receive the same, a multiple strand belt to carry a decalcomania through a water bath and deliver the same to a transfer point, a movable transfer-head having a belt held under tension and adapted to have a face thereof brought into pressure contact with a decalcomania, a resiliently supported pad adapted to stiffen one of the faces of the belt when contacting a decalcomania prior to removal and when affixing the same to an object, and pressure means to place said belt in surface contact with a decalcomania to expel air so that surface tension between the parts is developed to a point of greater tenacity than the tenacity of the wetted gum bond between the support and decalcomania whereby lateral movement of said head will slip the decalcomania from its paper support, and means to apply the gummed side of the decalcomania to said object.

7. In a machine adapted to transfer a decalcomania from a water soluble gum base to an object adapted to receive the same, a multiple strand belt to carry a decalcomania through a water bath and deliver the same to a transfer point, a resilient pad and a perforated belt held under tension and adapted to have a face thereof brought into pressure contact with a decalcomania, and pressure means to place said resilient pad and belt in surface contact with a decalcomania whereby air is expelled so that surface tension between the parts concerned is developed to a point of greater tenacity than the tenacity of the wetted gum bond between the support and decalcomania so as to enable lateral movement of the head to slip the decalcomania from its paper support, and pressure means to move said pad whereby the decalcomania is carried to said object, the perforations in said belt being adapted to admit air between the decalcomania and the belt to prevent air-locked adhesion between the

same when the transfer-head is lifted from the affixed decalcomania.

8. In a machine to transfer a decalcomania from a water soluble bond used to secure the same upon a paper backing to an object adapted to receive it, a conveyor to carry a decalcomania through a water bath and deliver the same to a transfer point, a yieldable pad upon a movable transfer-head, a curtain structure adapted to be payed out, said pad being adapted to be brought into pressure contact with said curtain and the face of said decalcomania whereby air and excess moisture is expressed from therebetween said curtain and said decalcomania to develop air-lock induced surface adhesion of greater adhesive qualities than the tenacity of the soluble bond against lateral pressure whereby the decalcomania will yield to lateral movement in response to lateral movement of said yieldable pad and slip from said paper backing while in adherence to said pad, said head being adapted to be subsequently moved into contact with said object to impress the decalcomania thereon.

9. In a machine to transfer a decalcomania from a water soluble bond used to secure the decalcomania upon a paper backing to an object adapted to receive the same, a conveyor to carry a decalcomania through a water bath to soften said bond and deliver the same to a transfer point, a yieldable pad upon a movable transfer-head, and a curtain drawn tautly across the face of said transfer-head thereof and being provided with minute spaced apertures, said transfer-head being adapted to place said curtain in pressure contact with the face of said decalcomania whereby air and excess moisture is expressed from therebetween to develop air-lock induced surface adhesion of greater tenacity than the adhesive qualities of the water softened bond against lateral pressure whereby the decalcomania will yield to lateral movement in response to lateral movement of the yieldable pad and slip from said paper backing while in adherence to said curtain, said pad being adapted to subsequently move into contact with said object to impress the decalcomania thereon said apertures being adapted to relieve air-lock between the pad and decalcomania when the pad is lifted after impressment of the decalcomania.

10. A transfer-head for a machine to transfer a decalcomania from its normal paper support to an object remote thereto, said head comprising an oscillatable head-structure having a pad yieldably supported upon a spring pressed stem aligned in the medial vertical axis of the head structure, and a curtain, said curtain having minute spaced apertures and being tautly positioned across and parallel with the lower face of said pad, and tension means to hold said curtain in its position parallel with and in contact with the lower face of the pad.

11. A machine to remove a wetted decalcomania from its support and affix the same upon an object, said machine including a yieldable plate with a pad on a face thereof, a retractable curtain, said curtain being pressable into surface contact with a decalcomania to exclude air from the point of such contact, and mechanism to laterally slide the decalcomania from its support, said last mentioned mechanism being vertically movable to bring said pad including the decalcomania into pressure contact with an article to be affixed with said decalcomania.

12. In a machine of the character described, a

frame including a table thereon, a plural number of belt strands adapted to move along the longitudinal axis of the table and in spaced relation with respect to the top surface thereof, a swingable arm having a head portion, said head portion being provided with a yieldable pad medially aligned therein, an apertured curtain held under tension and positioned under said pad, said swingable arm and head portion being movable laterally and vertically whereby the pad and curtain are brought recurrently during a cycle of operation into slight pressure contact with the said belt strands.

13. In a machine of the character described including a table, a belt adapted to move across said table and in spaced relation thereto, a head, a resilient pad pendantly position in said head and adapted to apply pressure upon said belt and said table, a perforated belt extending along the sides of and across the lower face of said pad, and means to pay out said perforated belt under tension whereby the same will partially encase an object when brought into pressure contact therewith, and means to laterally and vertically move the head.

14. In a machine to manipulate a wetted decalcomania with respect to its paper support, a yieldable plate, a retractable curtain positioned across said plate and adapted to be pressed into surface contact with a decalcomania to express air from between the contacting surfaces thereof so that the decalcomania will be air-locked to adherence with said curtain and plate, and means to move the head structure laterally from the paper support, and subsequently operating means to press the head structure including the decalcomania upon a surface adapted to receive the same.

15. In a machine to manipulate a wetted decalcomania, a head structure, a yieldable padded plate in said head structure, means to move the head structure in vertical and horizontal directions whereby said yieldable padded plate is brought into pressure contact with a decalcomania whereby an air-locked relationship is established between the contacting surfaces, and subsequently operating means to press the head structure including a decalcomania in adherence thereto upon a surface adapted to receive the same.

16. In a machine of the character described including a table formed with longitudinal slots therein, a plural number of belt strands movable across said table and in spaced relation thereto, a swingable head, a yieldable spring pressed pad medially aligned within said head and so positioned therein as to form a lower most surface, an apertured and retractable curtain so positioned with respect to said pad as to lie across the lower face thereof, means to vertically and laterally move said curtain and pad so as to cause the same to be moved into pressure contact with said belt strands and into immovable contact with said table to be in air-locked relationship with an object on said table, said previously stated movability being adapted to convey the object to a surface to receive the same and to press the object thereon.

17. In a machine of the character described including a table having recesses therein, a belt, means to move said belt an integrated variable distance per cycle of operation, a swingable head, a yieldable spring pressed pad medially aligned in said head and so positioned with respect thereto as to form a lower most sur-

face, an apertured and retractable curtain tautly positioned across the lower face of said pad, means to so vertically and laterally move said pad and curtain as to cause the same to be brought into pressure contact with the belt and table whereby an object thereon will be placed in air-locked adhesion with respect to the pad and curtain, said curtain being adapted to subsequently partially encase the sides of a repository for the object so that the sides of the object will be folded in contour with said repository.

18. In a machine of the character described including a table having recesses therein, a belt, means to move said belt an integrated variable distance per cycle of operation, a swingable head, a yieldable spring pressed pad medially aligned in said head and so positioned with respect thereto as to form a lower most surface, an apertured and retractable curtain tautly positioned across the lower face of said pad, means to so vertically and laterally move said pad and curtain as to cause the same to be brought into pressure contact with said belt and table whereby a wetted object thereon will be placed in air-locked adhesion with respect to said pad and curtain, said curtain being subsequently adapted to partially encase the sides of a repository for the wetted object so that the sides of the wetted object will be folded in contour with said repository.

19. In a machine as described and claimed in claim 18, means to facilitate impregnation of said object with water, said means comprising driven belts movable through water in depth, said belts being in side to side contact whereby

a decalcomania may be carried therebetween through said water and subjected to hydrostatic pressure of varying magnitude.

20. In a machine of the character described including a table having recesses therein, a belt, means to move said belt an integrated variable distance per cycle of operation, a swingable head, a yieldable pad medially aligned in said head and so positioned with respect thereto as to form a lower most surface, an apertured and retractable curtain tautly positioned across the lower face of said pad, mechanism to so vertically and laterally move said pad and curtain as to cause the same to be brought into approximate contact with an object on said belt and table and tension means to force said pad and curtain into pressure contact with the object on said belt and table where the said object is placed in air-locked relationship with said pad and curtain, said curtain being subsequently adapted to partially encase the sides of a repository for the said object so that the sides of the object will be folded in contour with said repository.

21. In a machine to transfer a decalcomania from a water soluble gum bond used to secure the decalcomania to a paper backing, means to facilitate softening said gum bond, said means comprising a relatively deep tank substantially filled with water, and including belt means to convey the decalcomania vertically through said water whereby the hydrostatic head afforded by the depth of the water will relatively quickly impregnate and soften said bond.

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