

July 21, 1953

A. L. SMITH ET AL
APPARATUS FOR AUTOMATICALLY TRANSFERRING
INDICIA FROM ONE SURFACE TO ANOTHER

2,645,870

Filed Nov. 20, 1950

2 Sheets-Sheet 1

FIG. 1.

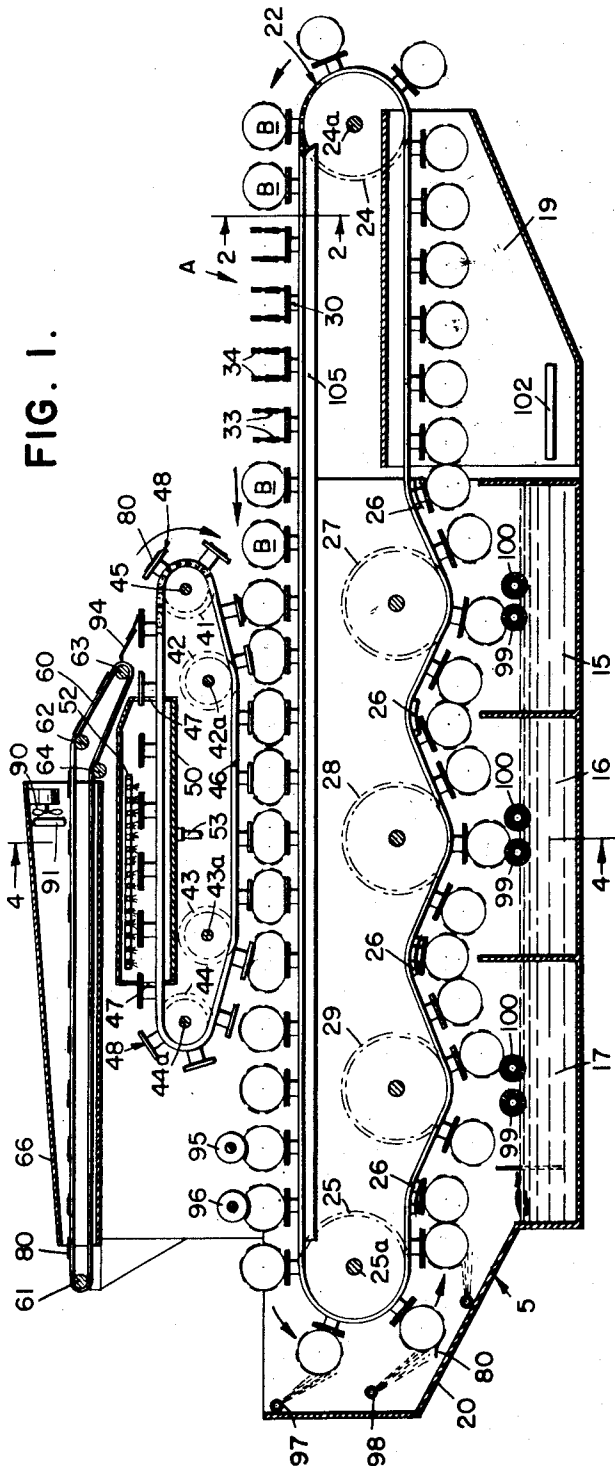


FIG. 3.

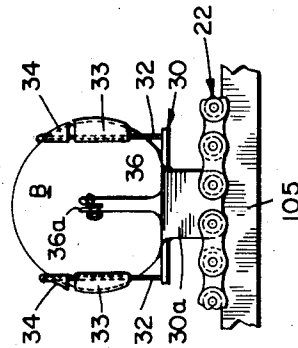
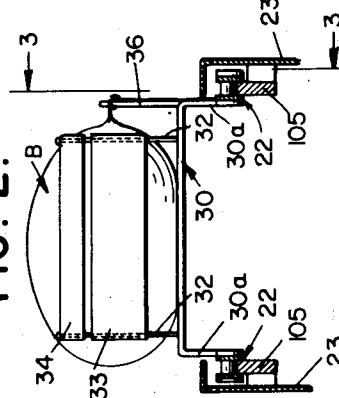


FIG. 2.



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FIG. 4.

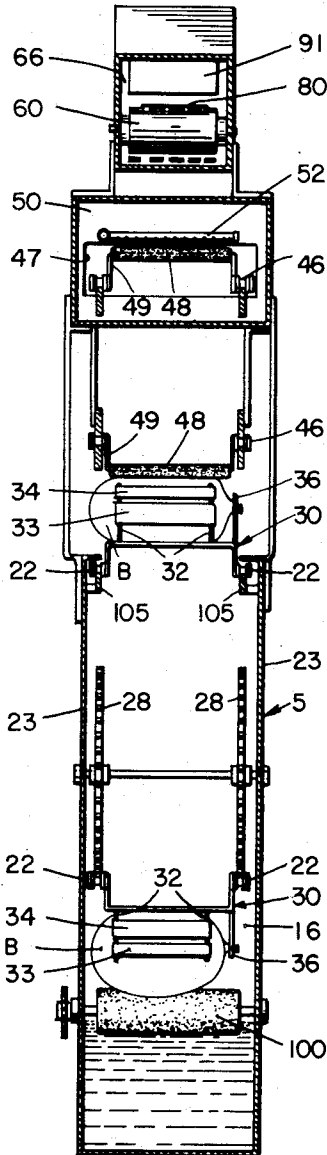


FIG. 5.

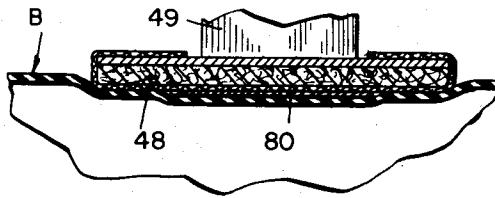


FIG. 6.

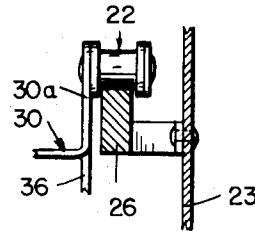
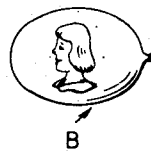


FIG. 7.



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2,645,870

APPARATUS FOR AUTOMATICALLY TRANSFERRING INDICIA FROM ONE SURFACE TO ANOTHER

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Application November 20, 1950, Serial No. 196,666

7 Claims. (Cl. 41-1)

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This invention has to do with apparatus for automatically transferring inked indicia from one surface to another. For instance, one of the chief advantages of the invention is found in its adaptability for applying indicia to inflated rubber balloons.

It is an object of the present invention to provide apparatus by which it is possible automatically to transfer indicia from a flat sheet of paper or the like onto a surface such, for instance, as the surface of an inflated rubber balloon.

Other advantages subordinate to this main object will appear hereinafter.

Without intending thereby to limit the broader scope of the invention as defined by the accompanying claims, we shall now describe a presently preferred embodiment, for which purpose reference will be made to the accompanying drawings, wherein:

Fig. 1 is a side elevation partly in section.

Fig. 2 is an enlarged section taken on line 2-2 of Fig. 1.

Fig. 3 is a view taken on line 3-3 of Fig. 2.

Fig. 4 is a vertical section taken on line 4-4 of Fig. 1.

Fig. 5 is an enlarged fragmentary detail of one of the pad elements in engagement with the balloon.

Fig. 6 is a fragmentary, sectional view of the chain supporting elements, and

Fig. 7 is an elevation of a balloon with indicia applied.

Referring to the drawings, we show the body 5 of the machine as comprising walls forming tanks 15, 16 and 17 and a drying tunnel 19. 20 denotes an end wall.

Parallel link conveyor belts 22 are carried by pairs of toothed pulleys 24-25 fixed on shafts 24a, 25a, suitably journaled in the body. Shaft 24a is power driven by means not shown. 27, 28 and 29 are pairs of idler pulleys, and pulleys 25 are, likewise, idlers. The conveyor belts are shown as travelling counterclockwise, being guided during part of their travel by arcuate guide members 26 fixed to the side walls 23.

Secured at their ends to the conveyor belts 22 are a plurality of inverted U-shaped supports or carriers 30, whose ends 30a are firmly connected to the belts. Each support has adjacent each of its ends a pair of upright posts 32 and elastic strips 33 are secured at their ends to the posts, while elastic bands 34 are also secured at their ends to the posts; thus, the strips 33 and bands 34 are drawn taut so that an inflated balloon B may be resiliently held therebetween. An upright 36 extends upwardly from one end of each

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support and is split at its top end, as shown at 36a, to hold the neck of the inflated balloon in such a pinched position that air cannot escape therefrom.

Above the body 5 we mount pairs of parallel toothed pulleys 41, 42, 43 and 44 upon which parallel link conveyor belts 46 are mounted to move in a clockwise direction. Pulleys 41 are mounted on a shaft 45 which is power driven by means not shown, while pulleys 42-44 are idlers mounted on shafts 42a-44a.

A plurality of longitudinally spaced absorbent felt pads 48 are carried by inverted U-shaped supports 49 which supports are in turn secured at their ends to belts 46. The belts 46 may travel through a tunnel 50 which has openings 47 at its ends to pass the belts and pads and has a water spray pipe 52 mounted therein, the pipe being supplied with water under pressure from a source not shown, so that water may be sprayed onto the pads while passing through the tunnel. A drain 53 leads from the bottom of the tunnel. The belts 46 are disposed so that as the respective pads 48 rotate into engagement with the respective balloons B, carried by the supports 30, the pads are pressed against the balloons as shown in Fig. 1.

To deposit indicia-bearing sheets onto the pads, I may provide a conveyor belt 60, mounted upon pulleys 61-64 and travelling through a tunnel 66. Each sheet 80 has a solution-coated indicia-bearing surface and the sheets are deposited, face up, on the left end of the belt 60 as by suitable automatic means, not shown, or by hand. The sheets 80 are then passed through the tunnel 66 on the belt, where the solution on the sheet is partially dried to a tacky state, as by heated air blown by a fan 90 over heating element 91. The sheets 80 are then deposited one at a time on a sloping bridge 94, which guides them sequentially onto the wetted pads 48 passing from tunnel 50. Inasmuch as the bottom surface of each sheet is dry and each pad is wetted, the sheets adhere to the pads by surface tension until the pads move over the pulleys 41, after which the pads press the carried sheets against the respective balloons moving with conveyor belts 22, causing the exposed, tacky surfaces of the sheets 80 to adhere to the balloons so that the solution-coated inked indicia on the sheets becomes integrated with the balloon surfaces. The balloons upon which the sheets have been thus deposited then travel beneath the kneading rolls 95, 96 which smooth the respective sheets upon the respective balloons.

Next, the balloons travel in the path of jets of

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water projected by nozzles 97, 98, which water softens and removes the paper sheets from the balloons, leaving only the indicia, which has then become integrated with the balloon surface.

The coating solution with which sheets 80 may be coated may be as described in the co-pending application Serial No. 109,068, filed August 6, 1949 by Arthur L. Smith.

The balloons now bearing the indicia are next lowered, with belts 22, sequentially into the tanks 17, 16 and 15, which contain water or other suitable cleaning liquid, the liquid being brushed onto the balloon surfaces by means of power-driven brushes 99, 100. The fixed guides 26 guide the belts 22 during this movement.

Finally, the indicia-bearing balloons travel through the tunnel 19, which is heated by the heating element 102, and move to the unloading station A, where a worker removes the balloons from the supports and applies fresh balloons.

The conveyor chains 22 ride over fixed support rails 105 so as to provide the chains with firm support while the pads 48 are pressing against the balloons carried on the supports 30.

In operation, the conveyors 22 are started moving counterclockwise and the conveyors 46 are started moving clockwise, while the coated sheets 80 are being deposited, one at a time, face up, on the left end of the conveyor belt 60. The operator, standing at the station A, which is not only the unloading but is also the loading station, starts placing inflated balloons between the respective pairs of elements 33, 34 carried by the conveyor 22. The pads 48, moving through tunnel 50, become wetted and as each pad passes beneath the bridge 94 it receives, face up, one of the coated indicia-bearing sheets 80 and moves it into engagement with one of the balloons carried by conveyor 22. The pads press the sheets against the inflated balloons with gradually increasing pressure sufficiently to squeeze the balloon into a somewhat flattened shape, as shown in Fig. 1, after which the balloons pass from engagement with the pads and beneath the kneading rolls 95-96, thence into the path of the water jets discharged from sprays 97, 98, which water softens and removes the sheets, leaving the indicia integrated with the balloon surfaces. The indicia-bearing balloons then pass sequentially into position to be brushed with the cleansing liquid in the respective tanks 17, 16, 15 by the brushes rotating in those tanks. After this the balloons pass through the drying tunnel 13 and into the unloading station where the operator removes the indicia-bearing balloons and replaces them with fresh balloons to be passed through the machine in the manner before-described.

The purpose of having three tanks 15, 16 and 17 is so that the tanks are progressively cleaner towards the unloading station, and so that the last cleansing operation is performed by the brushes in the tank 15, which contains the cleanest cleansing fluid.

We wish it understood that it is within the purview of our invention to eliminate, if desired, the belt 60 and the elements appurtenant thereto for automatically depositing the coated sheets 80 on the respective pads, since this operation may be performed manually by the operator either manually placing the sheets on the pads or directly on the balloons before the pads come into engagement with the balloons.

We claim:

1. In apparatus for transferring inked indi-

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cia from indicia bearing sheets onto articles having indicia receiving surface areas, the combination of a pair of movable continuous conveyors the first of which carries longitudinally spaced article carriers each arranged to support one of said articles with one of said sheets disposed in face to face contact with its indicia receiving area, and the second of which conveyors carries longitudinally spaced absorbent pads adapted to be wetted; said conveyors being so relatively disposed that during a portion of their movement said respective pads bear against said respective articles carried by the respective carriers in a manner to press said sheets against said areas, and means operable to move said conveyors in timed relation to each other.

2. In apparatus for transferring inked indicia from sheets onto articles having indicia receiving surface areas, the combination of a pair of relatively movable continuous conveyors the first of which carries longitudinally spaced carriers each arranged to support an article in position to receive a sheet in face to face contact therewith and the second of which carries longitudinally spaced absorbent pads, and means for automatically depositing said respective sheets on said respective articles carried by said respective carriers, said conveyors being so relatively disposed that during a portion of their movement said respective pads bear against the respective articles carried by the respective carriers whereby to press said sheets against said articles.

3. In apparatus for transferring inked indicia from indicia bearing sheets onto inflated balloons having indicia receiving areas, the combination of a first continuous conveyor carrying longitudinally spaced balloon carriers each having spaced opposed elastic strips for engaging opposite portions of a balloon, a second continuous conveyor carrying longitudinally spaced absorbent pads disposed to bear against the respective balloons carried by said carriers, and means for wetting said pads.

4. In apparatus for transferring inked indicia from indicia bearing sheets onto inflated balloons having indicia receiving areas, the combination of a first conveyor carrying longitudinally spaced balloon carriers each having spaced opposed elastic strips for engaging opposite portions of a balloon, a second conveyor carrying longitudinally spaced absorbent pads disposed to bear against the respective balloons carried by said carriers, and means for wetting said pads, said last named means comprising a tunnel so disposed that said second conveyor with its carried pads pass longitudinally therethrough, and liquid spray members mounted in said tunnel.

5. In apparatus for transferring inked indicia from sheets onto articles having indicia receiving surface areas, the combination of a pair of movable continuous conveyors the first of which carries longitudinally spaced carriers each arranged to support an article in position to receive a sheet in face-to-face contact therewith and the second of which carries longitudinally spaced absorbent pads, and means for depositing said respective sheets on said respective articles carried by said respective carriers, said conveyors being so relatively disposed that during a portion of their movement said respective pads bear against the respective articles carried by the respective carriers with gradually increasing pressure during a portion of the travel of said con-

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veyors, whereby gradually to press said sheets against said articles.

6. The apparatus of claim 1 which additionally includes spray means positioned and directed to project a liquid spray tangentially to the path of movement of the first of said conveyors whereby automatically to remove said sheets from said articles after said indicia has been transferred to said articles.

7. The apparatus of claim 1 which additionally includes means positioned along the path of movement of the first of said conveyors for automatically stripping said sheets from said articles after said indicia has been transferred to said articles, and means positioned further along the path of movement of the first of said conveyors for cleansing said articles, said latter means

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comprising a tank adapted to contain a cleansing liquid, a brush mounted to rotate partially submerged in said liquid, and a guide cooperating with the first of said conveyors to cause the same to move in a path capable of moving articles carried by said article carriers against said brush.

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