March 12, 1946. L. MARZOCCHI 2,396,589

CONVEYER FOR CYLINDRICAL ARTICLES

Original Filed Dec. 26, 1939 2 Sheets-Sheet 1

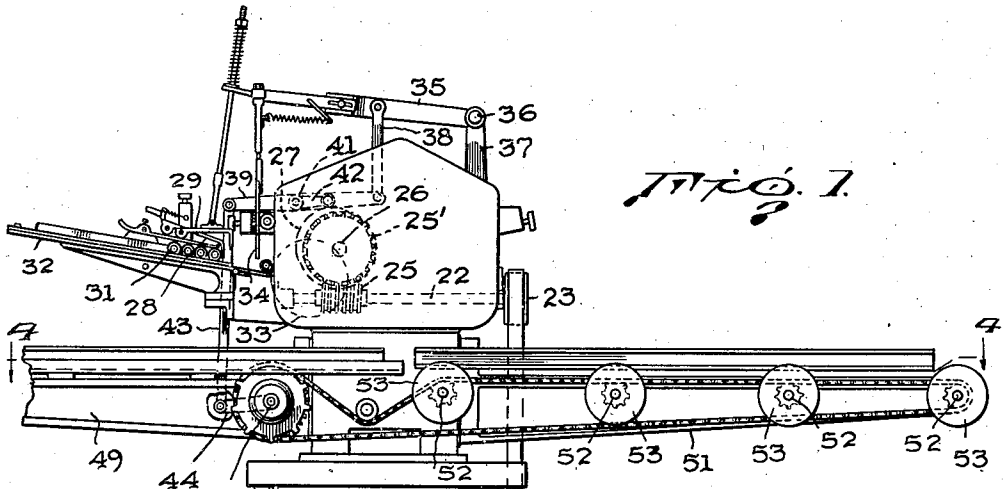


Fig. 1.

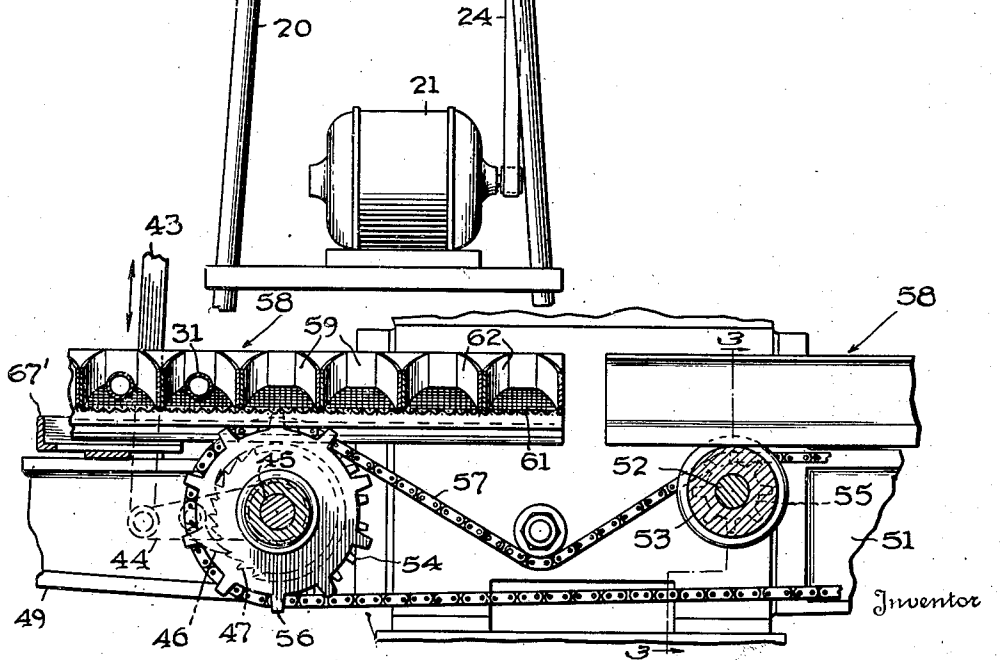


Fig. 2.

Inventor

Luigi Marzocchi,

By Charles B. Belknap

Attorney

March 12, 1946. L. MARZOCCHI 2,396,589

CONVEYER FOR CYLINDRICAL ARTICLES

Original Filed Dec. 26, 1939 2 Sheets-Sheet 2

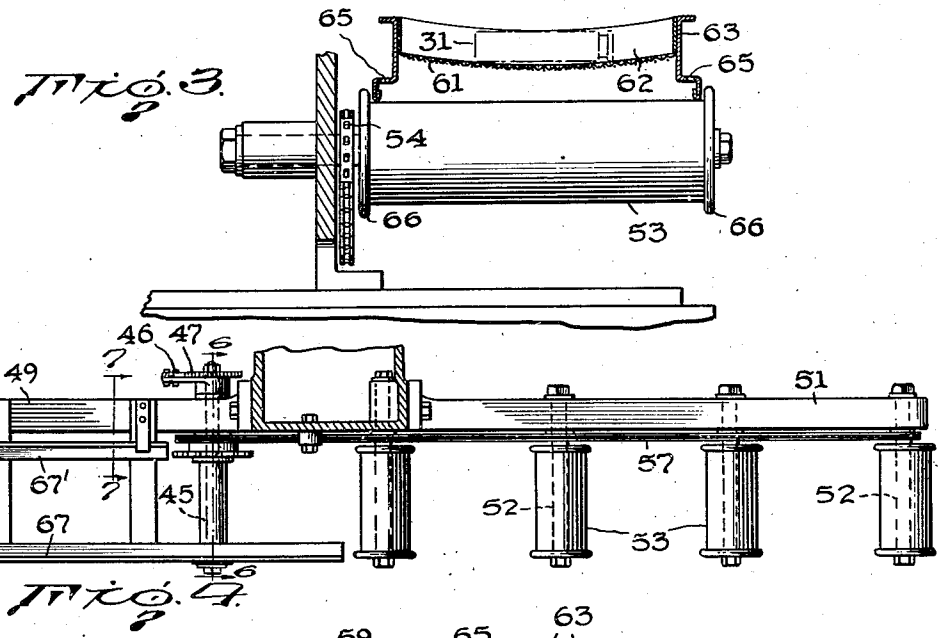


Fig. 3.

Fig. 4.

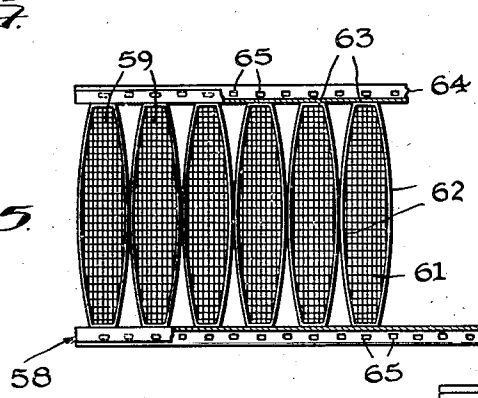


Fig. 5.

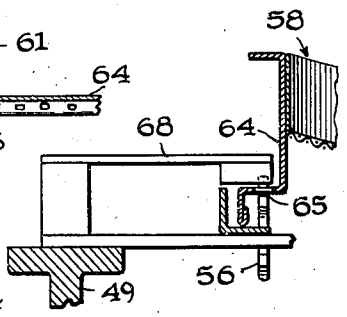


Fig. 7.

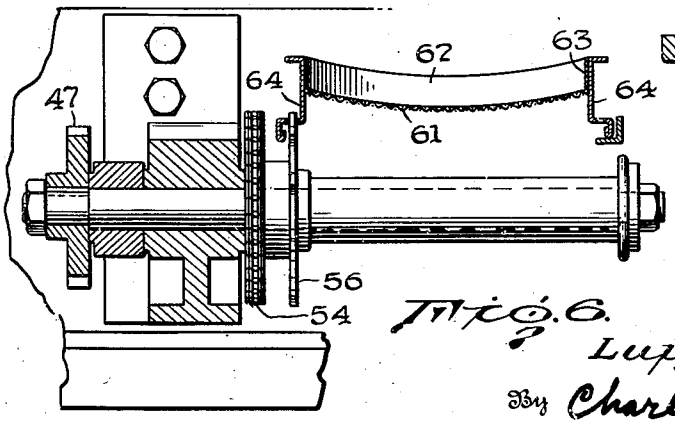


Fig. 6.

Inventor

Luigi Marzocchi,

By Charles B. Belknap

Attorney

Patented Mar. 12, 1946

2,396,589

UNITED STATES PATENT OFFICE

2,396,589

CONVEYER FOR CYLINDRICAL ARTICLES

Luigi Marzocchi, Milan, Italy; vested in the Alien Property Custodian

Original application December 26, 1939, Serial No. 311,019. Divided and this application March 25, 1941, Serial No. 385,180

5 Claims. (Cl. 226—2)

The present invention is a division of applicant's copending application Serial No. 311,019, filed December 26, 1939, now Patent Number 2,227,597, dated March 24, 1942 and relates to conveying mechanism for supporting and transferring cylindrical glassware upon which has been printed certain matter or indicia.

It has been found difficult so to deposit ware of the type referred to on suitable supports while the ink on the ware is still wet that smearing of the ink will be entirely obviated. It is, therefore, one of the objects of the invention to provide a conveyer, including suitable trays, which receive the cylindrical objects after the printing operation and operating in timed relation to the printing mechanism and which will support the printed surfaces in spaced relation to each other and from the conveyer.

A further object of the invention is to provide a novel form of tray advancing mechanism which will accurately position the trays to receive the ware at the end of the printing operation.

Still another object of the invention is the provision of perforate curved bottoms for the trays to reduce the area of contact between the ware and the tray and provide for the passage of air through the tray bottom to expedite drying of the printed design.

Other objects will be apparent from the following description of the invention taken in connection with the accompanying drawings of a preferred form of the invention in which

Fig. 1 is a front elevation of the machine;

Fig. 2 is a fragmentary elevation, partly in section, of the conveying mechanism;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a partial plan view of the conveyer, certain parts thereof being shown in section as indicated by the section line 4—4 in Fig. 1;

Fig. 5 is a fragmentary plan view of one of the trays employed in connection with the conveyer;

Fig. 6 is a section taken on line 6—6 of Fig. 4; and

Fig. 7 is a partial section taken on line 7—7 of Fig. 4.

In the drawings it will be seen that the printing mechanism and conveyer are mounted on a suitable base or frame 20 which also supports an electric motor 21. Fast on shaft 22 is a pulley or sprocket 23 connected to motor 21 by a belt or chain 24. Worm 25 on shaft 22 drives worm wheel 25' fast on shaft 26. Also secured to shaft 26 is a cam 27, the latter adapted to reciprocate the feeding and conveying mechanisms. The feeding mechanism includes oscillatable gates 28, 29, which release, one at a time, glass ware such as vials or ampoules 31, supported on inclined shelf 32. As the glass ware is released, it is rolled against a rotary printing roll 33 by means of a vertically reciprocable platen 34, the vial engaging face of the platen being concave. Gates 28, 29, and platen 34 are reciprocated vertically by arm 35 pivoted at 36 to a standard 37 on the machine, the arm being connected through link 38 to one end of lever 39, the latter being fast on shaft 41. Also secured to shaft 41 is a follower arm 42 cooperating with cam 27. Thus it will be seen that cam 27 actuates the gates and platen in timed relation through lever, link and arms referred to.

At that end of lever 39 opposite the connection for link 38 there is pivotally connected thereto one end of link 43 having a connection at its other end to arm 44 pivoted on shaft 45. A pawl 46 pivoted on arm 44 cooperates with the teeth of ratchet 47 keyed on shaft 45 to rotate the latter intermittently and in timed relation to the actuation of the ware feeding gates and the printing platen.

Suitably secured to the base of the machine in underlying relation to the printing mechanism are a pair of horizontally disposed brackets 49, 51, in which are journaled shafts 52 having fast thereon a series of conveyer drums 53, and shaft 45 to which is fixed drive sprocket 54. Also secured to shafts 52 are sprockets 55 while a tray engaging sprocket 56 is fixed to shaft 45. It will be seen that the diameters of sprockets 55 are less than that of sprocket 54. Chain 57 engages all of the sprockets 54, 55, so that they rotate in timed relation to each other. It will, therefore, be seen that with each reciprocation of the platen 34 and pawl actuating link 43, the sprockets are turned through a predetermined angle.

Each of the trays 58 comprises a plurality of transverse contiguous pockets or compartments 59, the bottoms of which are formed from perforate or reticulate material 61 to provide for passage of air therethrough. Further, the bottoms are concave, as shown in section in Figs. 3 and 6, so that a cylindrical article lying thereon is supported by the bottom only at the ends of the article, as illustrated by the vial shown in dotted lines in Fig. 3. The tray pockets are made up of curved transverse dividing walls 62 and ends 63. The ends of the pockets are connected to a pair of parallel side plates 64 each of which is bent outwardly and then downwardly, as shown in Fig. 7. The bottom edge is then folded upon itself so that an inverted L-shaped flange having a reinforced lower edge is provided along each side of the tray. The lateral portion of these flanges is

provided with spaced perforations 65 to form a rack engageable with sprocket 56. It is to be noted that the perforations are spaced a distance equal to that between the pockets and that sprocket 56 turns through an angle with each intermittent movement thereof sufficient to move the tray a distance corresponding to that between the centers of two adjacent pockets.

As will be seen in Fig. 3, drums 53 have a relatively smooth cylindrical surface upon which the lower turned edges of the side plates rest. Flanges 66 on the drums prevent lateral displacement of the trays during their travel over the conveyer. While the surface of the drums is smooth, there is sufficient friction between the lower edges of the trays and the drums to move the trays upon rotation of the drums. Thus the trays are carried toward sprocket 56 by the drums until the teeth of sprocket 56 engage the rack portion of the tray sides. The tray is then given a step-by-step movement corresponding to the distance between the pockets of the trays. As stated hereinbefore, sprockets 55 are smaller than sprocket 54. Hence, their angular velocity is greater than that of the drive sprocket 56. Trays carried by drums 53 will, therefore, move more rapidly than a tray being moved by sprocket 56. This arrangement permits the machine operator to place empty trays on the drums without regard to the spacing therebetween. At the same time the empty trays on the drums, moving a greater distance than one engaged by the drive sprocket, will "catch up" with the tray immediately under the platen. In this way successive trays are brought into end abutting relation and a pocket is always disposed beneath the platen. Since the surface of the drums is smooth, relative sliding movement between the drums and tray which has caught up with another being driven by the sprocket is permitted.

Mounted on bracket 49 are a pair of parallel rails 67, 67', spaced a distance substantially equal to that between the lower edges of the tray sides. Rail 67' is somewhat shorter than rail 67 to permit engagement of the drive sprocket with the tray. The rails support the trays and permit sliding movement thereof until they are removed by the machine operator. To prevent elevation of the tray while it is in engagement with the drive sprocket a yieldable abutment 68, shown in Fig. 7, is attached to the bracket and overlies the rack portion of the tray near the drive sprocket.

The operation of the machine will be apparent from the foregoing description thereof. As a vial is released and permitted to roll into engagement with the printing roll, the platen is lowered and urged into engagement with the vial, sufficient pressure being imposed on the vial to insure transfer of the design from the printing roll to the vial. At the same time the platen descends at such speed that rotation of the vial by the printing roll is permitted to provide for rolling contact therebetween without slippage. In this way the design is transferred without smearing of the ink. Further, the platen, having a concave face, engages only a narrow circumferential portion of the vial adjacent its ends so that not only is smearing obviated, but it is evident that the design may extend circumferentially around the vial substantially through 360°. The platen is then cammed away from the vial, permitting the latter to drop into one of the tray compartments. The trays are moved intermittently and in such timed relation to the operation of the printing roll and platen that an empty compartment is presented beneath the platen with each descent thereof. The concave perforate bottoms of the trays insure proper support of the vials after the design has been printed thereon, there being no possibility of contact between the bottom and that portion of the vial having the design thereon. Since free pasage of air through the bottom hastens drying of the ink, it is apparent that the combined printing and drying operations are expedited.

While a preferred form of the invention has been illustrated and described, it is not intended that the invention be limited to the precise arrangement of parts, but is to be construed broadly within the meaning of the appended claims.

What is claimed is:

1. A conveyer for cylindrical objects comprising a tray to receive objects after being printed, said tray having a plurality of spaced transverse compartments, each adapted to accommodate a single object, a sprocket, means for rotatably supporting said sprocket, said tray having parallel apertured side frames thereon arranged to be engaged by said sprocket, and means for intermittently rotating said sprocket to impart an intermittent and progressive movement to said tray.

2. A conveyer for cylindrical objects comprising means for supporting a plurality of trays having spaced compartments adapted to receive the objects subsequent to printing thereof, a sprocket, means for rotatably supporting said sprocket, means on said trays arranged to be engaged by said sprocket for progressively moving the trays, means for intermittently rotating said sprocket to move a tray a distance equal to the spacing of two adjacent compartments, a plurality of relatively smooth drums for moving another of the trays simultaneously and in the same direction of said one tray, and means on said drums actuated by the means for rotating said sprocket for rotating the drums at a speed greater than that of said sprocket.

3. A conveyer for cylindrical objects comprising a plurality of elongated pocket members arranged in parallel spaced relation and extending transversely with respect to the travel of the conveyer, each pocket having a perforate bottom curved only in longitudinal cross-section and adapted to accommodate a single cylindrical object, and means for moving said conveyer.

4. A conveyer comprising a tray having a plurality of spaced, transversely extending compartments for reception of single objects, a toothed wheel, means rotatably supporting said toothed wheel, longitudinally spaced tooth-accommodating apertures formed along said tray with which the teeth on said toothed wheel mesh, and means for imparting intermittent rotation to said toothed wheel to impart progressive intermittent motion to the tray.

5. A conveyer comprising a tray having a plurality of spaced, transversely extending compartments for reception of single objects, a toothed wheel, means rotatably supporting said toothed wheel, longitudinally spaced tooth-accommodating apertures formed along said tray with which the teeth on said toothed wheel mesh, and means for imparting intermittent rotation to said toothed wheel to impart progressive intermittent motion to the tray, said tray having a lateral flange in which said apertures are formed, and means engaging the side of said flange remote from said toothed wheel and positively preventing demeshing of the teeth from said apertures.

LUIGI MARZOCCHI.