CONTAINER FILLER APPARATUS

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ABSTRACT

An automatic machine is provided for filling containers with a prescribed amount of liquid, such as paint. The empty containers are successively transferred from a first conveyor to a second conveyor by means of a continuously turning horizontal turntable which receives each of the containers in a peripheral groove formed therein. A flexible hose has its spout supported in a bracket coaxially mounted with a turn-table. The bracket turns with the turn-table so that the spout of the flexible hose follows each container as it is transferred by the turn-table, so that the container may be filled while it is still in motion. The filled container is transferred by the turn-table to the second conveyor, which carries it away from the turn-table to a capping station at which a lid is applied.

5 Claims, 4 Drawing Figures
CONTAINER FILLER APPARATUS

BACKGROUND OF THE INVENTION

Automatic machines are available in the prior art for filling containers, such as cans, with metered amounts of paint, or other liquid. Such machines usually comprise a conveyor along which the containers are transported successively to a filling station. Each container is stopped at the filling station until it is filled with a metered amount of the paint or other liquid, and it is then moved on to a capping station at which appropriate lids are attached to the containers. Other automatic machines are also known to the prior art by which the containers are filled without the necessity of the intermittent motion such as in the prior art machine described above.

The machine of the present invention is also one that does not require the containers to be stopped while being filled with the liquid. The container filler machine of the invention is less complicated and less expensive than the prior art machines, and yet it incorporates all the desirable features of the prior art machines and operates at a substantially higher rate.

The embodiment of the invention to be described includes first and second conveyors disposed essentially at right angles to one another, and a continuously-turning turn-table at the junction of the two conveyors for transferring the containers from one of the conveyors to the other. As each container is transported by the turn-table, it is followed by the spout of a flexible hose so that a metered amount of liquid may be introduced into the container without the need to stop its motion during the filling operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective representation of a machine representing one embodiment of the invention;

FIGS. 2 and 3 are fragmentary plan views of portions of two embodiments of the invention; and

FIG. 4 is a plan schematic representation of the machine of FIG. 1.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

The machine illustrated in FIG. 1 and 2 includes a frame, a first conveyor or chute, 10 mounted on the frame which transports empty cans from an unscrambler table, and a second conveyor 12 mounted on the frame and displaced angularly from the first conveyor to transport the filled cans to a capping station. A turn-table 14 is rotatably mounted on the frame at the junction of the conveyors 10 and 12. The exit of the conveyor 10 and the entrance to the conveyor 12 are both adjacent the periphery of the turn-table 14. The turn-table 14 rotates above a stationary base plate 15 (FIG. 2) which has a segment removed to receive the entrance of the conveyor 12, as shown.

The turn-table 14 has a peripheral groove 14a therein which receives each container, as the turn-table rotates, and as the containers are moved against the edge of the turn-table by the conveyor 10. A lobe is removed at one side of the groove to facilitate the entry of the empty cans. The turn-table 14 therefore serves to transfer the containers successively across the base plates from the chute 10 to the conveyor 12. The containers are then transplanted by the conveyor 12, for example, to an appropriate capping station at which lids are attached to the containers.

The turn-table 14 is mounted, for example, on a shaft 20, and the shaft 20 is driven by an electric motor 22 through a speed control 24. The motor 22 serves to turn the turn-table 14 continuously, as long as the machine is in operation. The speed control 24 permits the speed of rotation of the turn-table to be changed for different paint viscosities.

A radial bracket 30 is mounted coaxially with the turn-table 14, and the bracket turns with the turn-table. A flexible hose 32 has its spout rotatably supported in the bracket 30 to be directly over the container held in the groove 14a. Therefore, as each container is transferred by the turn-table 14 from the conveyor 10 to the conveyor 12, it is disposed directly under the spout of the flexible hose 32, so that it may be filled with a particular liquid, such as paint.

The hose 32 is coupled to a pipeline 34 which, in turn, is coupled to the outlet of a reciprocating pump/cylinder 36. The piston/cylinder 36 may be any appropriate commercial type. For example, this assembly may be of the type presently marketed by the Neumo Division of Cherry Burrell Corporation, 105 West Adams Street, Chicago, III. 60603. The function of the unit 36 is to introduce a metered amount of the desired liquid into the particular container being transferred by the turn-table 14, each time its reciprocating drive rod 38 is actuated.

The liquid may be introduced into a hopper 40 by an inlet pipeline 42, and withdrawn from the hopper by the unit 36 in metered amount for each actuation of the unit 36. A limit switch 50 is mounted on the turn-table 14 adjacent the groove 14a, and each time a container is received in the groove 14a, the limit switch is operated to activate a power source 52. The power source 52, in turn, operates a valve 54 at the spout of the flexible hose 32 and also energizes a pump activator 56 which moves the piston/cylinder pump 36 through one cycle, to introduce a predetermined amount of liquid through a "shower head" 56 into the container being transferred by the turn-table. The shower head 56 is equipped with a number of small holes through which the paint passes, and it serves to prevent drip when the valve 54 is turned off as the paint forms a meniscus in each hole.

The invention provides, therefore, an extremely simple and straightforward machine for automatically filling containers with an appropriate liquid. The machine is extremely simple in its construction, and is inexpensive to build. Moreover, the machine is simple to operate, and is fast and reliable in its operation.

A double-acting piston/cylinder pump may be used, so that a filling operation is achieved each time the piston in the pump 36 is moved either to the right or to the left. This would permit a filling operation over a longer portion of each turn of the turn-table 14, so that the paint filling velocity may be slowed down to avoid splashing while yet maintaining the same filling rate as in the single-acting embodiment. The limit switch 50 in the modified structure would cause the power source 52 to activate the pump activator 56 in such a manner that for each operation of the switch 50, a corresponding movement was imparted to the piston in the unit 36, first to the right, and then to the left. When a double-acting pump is used, the conveyors 10 and 14 would be
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arranged as shown in FIG. 3 to obviate wasted dwell
time.

Having described the invention as related to particular
embodiments, there is no intention that the inven-
tion should be limited by any of the details of the de-
scription, unless otherwise specified. Rather, the inven-
tion is intended to be construed within its spirit and
scope as set forth in the accompanying claims.

What is claimed:

1. A machine for automatically filling each of a suc-
cession of containers with liquid, said machine com-
prising: transferring means; means for moving the con-
tainers in succession to said transferring means to be
successively transferred thereby, a bracket mounted
over said transferring means and movable therewith; a
flexible hose having a spout at one end supported in
said bracket and movable therewith to be disposed di-
rectly over the container transferred by said transferr-
ing means; a source of liquid displaced from said trans-
ferring means; and a pipeline displaced from said trans-
ferring means and extending from said source to the
other end of the flexible hose to suspend the flexible
hose over the bracket and for introducing liquid to the
hose to be filled into the containers.

2. A machine for automatically filling each of a suc-
cession of containers with a liquid, said machine com-
prising: a first conveyor having an exit end and serving
to transport the containers in succession to its exit end;
a second conveyor angularly displaced from said first
conveyor and having an entrance end and serving to
transport the containers away from its entrance end;
transferring means mounted between the exit end of
said first conveyor and the entrance end of said second
conveyor and rotatable about a vertical axis for succes-
ively transferring the containers from the first con-
voyer to the second conveyor; bracket means mounted
over said transferring means and rotatable therewith
about said vertical axis; a flexible hose having a spout
at one end supported in said bracket means and mov-
able therewith to be disposed directly over each con-
tainer carried by said transferring means for introduc-
ing the liquid into each container as the container is
transferred by the transferring means from the first
conveyor to the second conveyor; a source of liquid
displaced from said vertical axis; and a pipeline dis-
placed from said vertical axis and extending from said
source to the other end of the flexible hose to suspend
the flexible hose over the bracket and for introducing
liquid to said hose to be filled into the containers.

3. The machine defined in claim 2, in which said
transferring means comprises a turn-table.

4. A machine for automatically filling each of a suc-
cession of containers with a liquid, said machine com-
prising: a rotatably mounted turn-table rotatable about
a vertical axis having at least one container-receiving
groove extending radially inwardly from the peripheral
dge thereof; a first conveyor having an exit and adja-
cent said turn-table for transporting containers in suc-
cession to said turn-table to be received successively in
said groove; a second conveyor displaced angularly
from said first conveyor and having its entrance end ad-
jaent said turn-table for receiving containers from said

groove; rotatable bracket means mounted coaxially
with said turn-table for rotation therewith about said
vertical axis and displaced upwardly from said turn-

table; and a flexible hose having a spout at one end ro-
tatably mounted in said bracket means to be displaced
radially from the axis of rotation thereof and to be in
vertical alignment with said groove; a source of liquid
displaced from said vertical axis; and a pipeline dis-
placed from said vertical axis and extending from said
source to the other end of the flexible hose to suspend
the flexible hose over the bracket and for introducing
the liquid to said hose to be filled into the containers.

5. The machine defined in claim 4, in which said in-
roducing means includes a metering mechanism for
causing said hose to introduce a predetermined amount
of the liquid into each of the containers.

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