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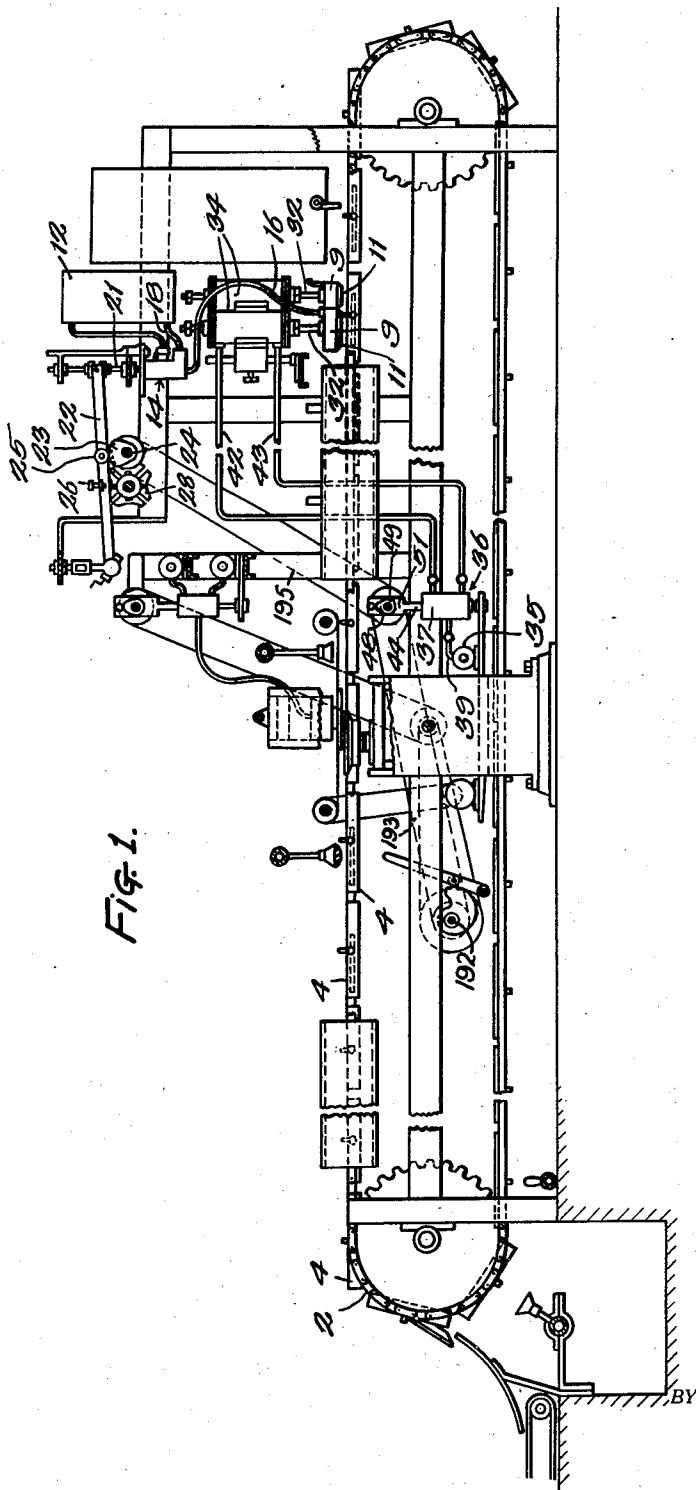
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APPARATUS FOR APPLYING LIQUID SIZE TO POTTERY WARE

Original Filed Aug. 21, 1941

2 Sheets-Sheet 1



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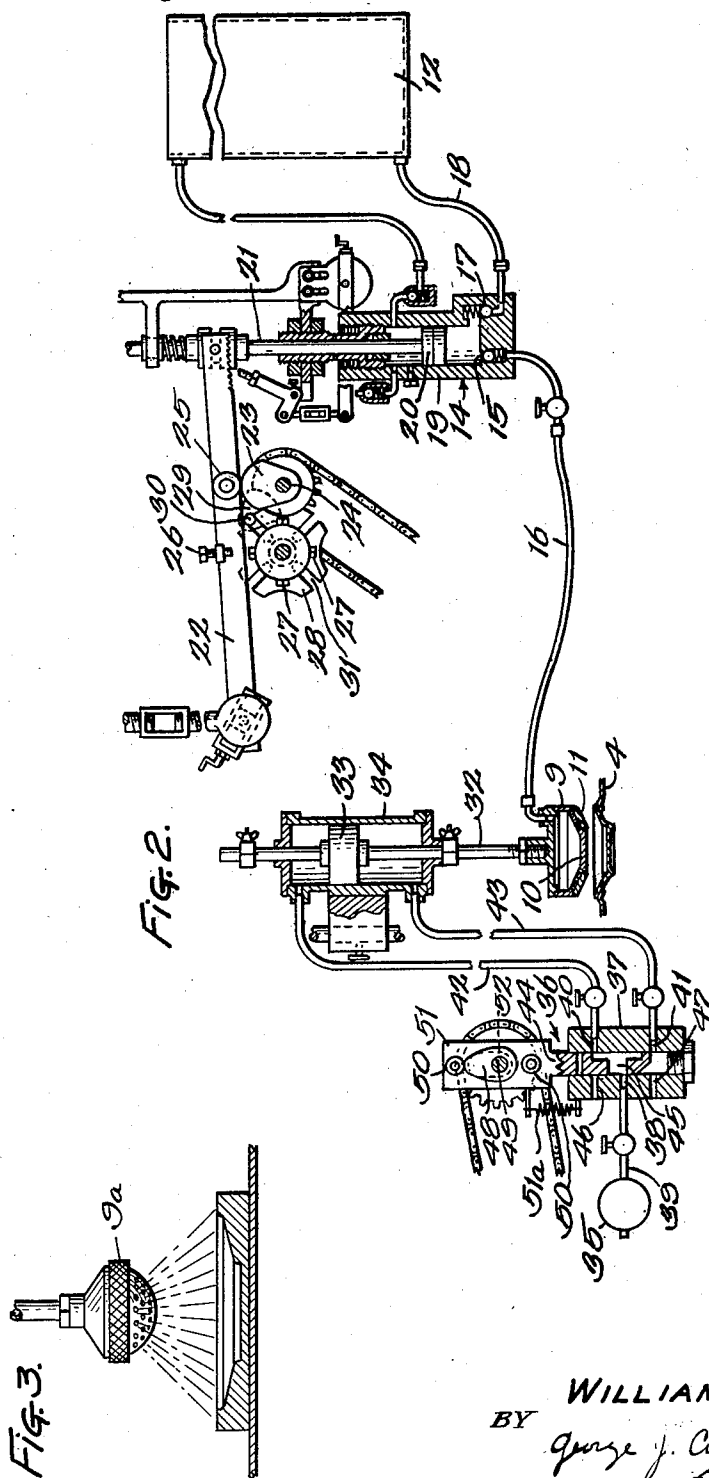
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,450,438

APPARATUS FOR APPLYING LIQUID SIZE
TO POTTERY WARE

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Original application August 21, 1941, Serial No.
407,733. Divided and this application Decem-
ber 10, 1942, Serial No. 468,514

2 Claims. (Cl. 91-12)

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This is a divisional of my co-pending applica-
tion for United States Letters Patent No. 407,733
filed August 21, 1941.

This application has to do with apparatus for
applying liquid size to articles such as pottery-
ware dishes, cups and saucers and the like
preparatory to decorating by applying decalco-
mania transfers thereto.

Heretofore, it has been customary to brush or
daub a sticky liquid on the surface of the pottery-
ware which receives the decalcomania. It is the
object of the present invention to accomplish this
operation automatically in order to save time and
material and also to insure a more uniform coat-
ing of the ware piece with size. In this way, the
degree of tackiness will be more or less uniform
over the entire surface to be decorated on the
ware and other advantages will be noted as the
description progresses.

In the drawings:

Fig. 1 is an elevation of a decalcomania apply-
ing machine diagrammatically illustrating my
size applying apparatus being used in conjunction
therewith.

Fig. 2 is a detail partly in section of the size
applying apparatus of this invention.

Fig. 3 is a detail showing another form of de-
vice for applying size to the ware.

My co-pending application comprehends a
complete system for applying decalcomania
decoration to the ware which includes such ap-
paratus as a ware feeder which loads the ware
conveyor that carries the ware to a sizing sta-
tion, a drying station, decal cutting and applying
station, a washing station and a ware unloading
station. The present invention has to do with
the size-applying apparatus only and it will
suffice to say that the ware to be sized is delivered
by a conveyor 2 to the size-applying apparatus
on trays 4 having laterally spaced seats which ac-
commodate different sizes of ware.

Each tray load of ware is brought to a size
applying station where a plurality of size apply-
ing members 9 are arranged transversely of the
conveyor, which is lowered into contact with the
plate to apply the size and then is raised. Each
applicator is in the form of a hollow head having
a perforated bottom portion 10 conforming gen-
erally to the face of the ware and having a facing
11 of porous resilient material, such as felt, also
conforming to the ware face.

The size is supplied to the head 9 as it is raised
from a supply tank 12 by way of a force-feed
charging and measuring device 14 for deter-
mining the proper amount of size to be supplied

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to the head 9. Generally, the charging device is
in the form of a pump having a check valve con-
trolled outlet 15, see Fig. 2, connected with the
head 9 through a flexible conduit 16 and having
a check valve controlled inlet 17 connected with
the bottom of the supply tank through a con-
duit 18. The felt facing becomes saturated with
size and when pressed against the ware leaves a
film of size on the surface thereof. The pump
replenishes the size absorbed from the chamber
by the felt.

Said pump, Fig. 2, comprises an upright cylin-
drical casing 19 within whose bottom end the out-
let 15 and inlet 17 are located. Within the cas-
ing 19 operates a piston 20 secured to the bottom
end of a piston rod 21, which is reciprocated by
having a sliding pivotal connection with the free
end of a lever 22 operated in turn by a cam 23
on a continuously rotating shaft 24, and engag-
ing a roller 25 on the lever 22. The shaft 24 com-
pletes one revolution for each movement of the
conveyor 2 and is so timed that it will cause the
piston to raise and draw into the chamber portion
therebelow a given amount of size from the tank
12 as the applicator head 9 is lowered and
whereby the piston will be lowered as the head 9
is raised to force the measured quantity of size in
the pump chamber into the head 9. To regulate
the range of reciprocation of the piston 20 in de-
termining the desired quantity of size to be
drawn by the piston into the pump chamber and
then fed to the head 9, the lever 22 has an ad-
justable set screw 26 which limits the downward
movement of the lever by engaging one of four
adjustable stops or bolts 27 equally spaced about
the hub of the four-pointed star wheel 28 of a
Geneva motion device.

The star wheel 23 is rotated a quarter turn for
every complete revolution of the shaft 24 by a
lever 29 on said shaft having a pin 30 operating
in one of the radial slots 31 formed in the points
of the wheel. When the production in a particu-
lar line or lines is non-diversified, then as in the
present case, the stops 27 are adjusted uniformly
above the axis of the wheel 23. Thus each stroke
delivers the same quantity of size. However, if
the production is diversified, the stops 27 may
be adjusted at different heights from the axis
of the wheel 23 in order to regulate the range of
reciprocation of the piston 20 and varying quan-
tities of size will be delivered according to the
requirements of the various pieces in sequence in
the production line.

The size applying head 9 (see Fig. 2) is de-
tachably secured to the lower end of a piston rod

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32 having a piston 33 operating within a cylinder 34. Fluid under pressure is alternately supplied to the cylinder 34 at opposite sides of the piston 33 from a suitable source by a pump 35 through the slide valve device 36. The valve 36 includes a valve cylinder 37 having an inlet port 38 connected by a conduit 39 to the outlet of the pump 35 and has a pair of outlets 40 and 41 in its opposite side connected by conduits 42 and 43 to the opposite ends of the chamber of the cylinder 34. A valve member 44 operates within the valve cylinder 37 with a single port 45 therein alternately establishing communication between the inlet 38 and the outlets 40 and 41 to cause reciprocation of the piston 33. Suitable vent ports 46 and 47 are provided in the valve cylinder 37 and valve member 44 respectively to properly vent opposite end portions of the cylinder 34 during operation.

Generally, the valve member 44 is operated by a cam 48 on a constantly rotating shaft 49 and arranged to alternately engage rollers 50 provided on the sides of the head 51 of the valve member. The head 51 has a longitudinal slot 52 through which the shaft 49 freely extends. A spring 51a is connected to the head 51 and the cylinder housing 37 for an obvious purpose.

Shaft 49, which is continuously driven by chain 193 connected to a main power shaft 192 of the machine, Figures 1 and 2, also drives shaft 24 by means of sprocket chain 195. Thus the drive between the two shafts is co-ordinated so as to cause the size to be fed to the applying head in timed relation with the up and down movement thereof and the intermittent movement of conveyor 2.

If desired, the size may be sprayed onto the surface of the ware by means of a spray gun 9a, see Fig. 3, which may be intermittently operated by such a suitable cam actuated slide valve device as just described.

The present method and apparatus may be used to size dinner or tableware other than ware composed of pottery clay, for instance glass, metal or other composition. The invention is shown and described in connection with decorating fired pottery ware but it will be understood that the term "and the like" as used in the claims may designate table or dinnerware made of other compositions just mentioned.

I claim:

1. Apparatus for applying decalcomania size

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to fired potteryware and the like comprising, in combination, a ware support, a size applying member thereabove, means for moving said support and said member relative to one another to effect a size applying operation, a source of size supply, a pump having a piston for delivering size from the source of supply to said member, means for varying the stroke of the pump piston to thereby vary the amount of size delivered by the pump, and a drive for co-ordinating the operation of said first named means and said pump.

2. Apparatus for applying decalcomania size to fired potteryware and the like comprising, in combination, a ware support, a size applying member, means for moving said support and said member relative to one another to effect a size applying operation, a source of size supply, a pump having a piston for delivering size from the source of supply to said member, means for automatically varying the amount of size delivered on successive strokes of the pump piston and drive means for co-ordinating the operation of said first named means and said pump.

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