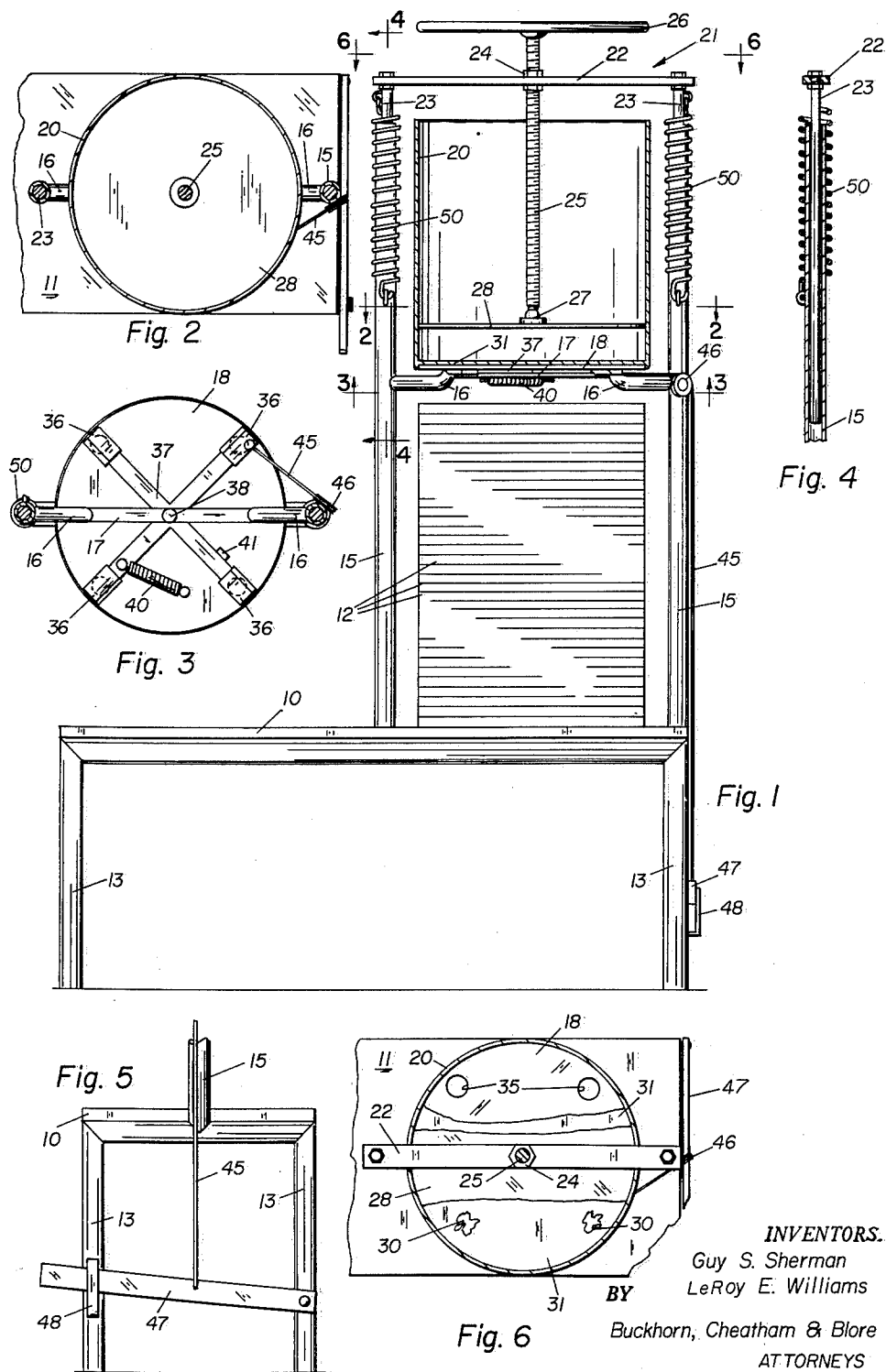


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 MACHINE FOR SIMULTANEOUSLY DISPENSING A PLURALITY
 OF SUBSTANTIALLY EQUAL QUANTITIES
 OF A VISCOUS SUBSTANCE
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MACHINE FOR SIMULTANEOUSLY DISPENSING A PLURALITY OF SUBSTANTIALLY EQUAL QUANTITIES OF A VISCOUS SUBSTANCE

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Our present invention comprises a machine for dispensing simultaneously a plurality of substantially equal quantities of a viscous substance such as mastic or an adhesive employed to attach acoustic tile to ceiling surfaces, or the like. Such substances are usually very viscous and will not flow under gravity alone, so that pressure must be applied in some manner or another. Ordinarily such substances are distributed commercially in standard cylindrical containers such as one gallon or five gallon cans, the cans being provided with an internal flange at one end for engagement by a flanged cap.

Normally the application of adhesive to such articles as acoustic tile is accomplished manually by the workman scooping irregular quantities of the adhesive from the container with a paddle or the like and smearing the substance onto the tile. Such operations are tedious and tiring, resulting in rapid loss of efficiency and increased expense in application of the tile surface. The present invention is designed to eliminate much of the manual labor normally associated with such work.

An object of the present invention, therefore, is to provide means for rapidly applying globules of a viscous or adhesive substance to the surface of an article such as acoustic tile, with a minimum amount of muscular effort on the part of the workman.

A further object of the present invention is to provide means for applying substantially equal quantities of a viscous substance at a plurality of points in definitely spaced relationship to each other upon the surface of a tile or the like, thereby easing application since uniform motions of a smoothing paddle will spread the substance so that uniform pressure at certain points on the tile itself will suffice to position the tile properly on the ceiling or wall surface.

The substances normally employed for the purposes outlined usually comprise a volatile solvent. In the normal manual dispensing of such substances the container must remain open to the atmosphere for long periods of time, so that as the work progresses the solvent evaporates and the substance becomes thicker. Some such substances even change their molecular composition, so that they cannot be revitalized by stirring in more of the solvent. If a partially used container is recapped, a surface portion of the substance is usually lost by evaporation of the solvent and the formation of a tough skin on the remaining portion of the substance. A further object of the present invention is to provide means whereby the amount of the substance remaining in the container is at all times within a closed space, so that the solvent will not be lost or the substance otherwise allowed to change its character before application.

The foregoing and other objects and advantages of the present invention will be more readily apparent from inspection of the following specification, taken in connection with the accompanying drawings, and in which like numerals refer to like parts throughout.

In the drawings,

FIG. 1 is a side elevation of a preferred embodiment of the present invention, portions thereof being shown in vertical section;

FIG. 2 is a partial horizontal section taken substantially along line 2—2 of FIG. 1;

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FIG. 3 is a partial horizontal section taken substantially along line 3—3 of FIG. 1;

FIG. 4 is a partial vertical section taken substantially along line 4—4 of FIG. 1;

FIG. 5 is a partial end view of FIG. 1; and

FIG. 6 is a horizontal section taken along line 6—6 of FIG. 1 with portions of the apparatus broken away.

The invention preferably comprises a table including a top member 10 providing a working surface 11 upon which a vertical stack of a plurality of planar articles such as acoustic tile 12 may be positioned, the top 10 being supported by legs 13. A pair of posts 15 rise vertically from the table top on opposite sides of the portion thereof holding the stack 12, the posts rising to a considerable height above the stack. A pair of radially directed arms 16 extend toward each other from the posts 15 and are connected together by a crossbar 17. The arms are rigidly affixed to a supporting shelf 18 which is preferably in the shape of a disc having a diameter such that the usual bottom flange of a container 20 will snugly fit over the disc. The shelf, however, may have any suitable form since other means will maintain the container 20 in desired position, as will presently appear.

The posts 15 are preferably in the form of sections of tube, and a movable structure 21 is mounted upon the posts, the structure comprising a crossbar 22 and a pair of rigidly affixed depending guide rods 23 which respectively telescope with the tubular posts. A nut 24 is fixed to the center of the crossbar 22 and is threadedly engaged by a vertical screw-shaft 25 which extends coaxially into the container 20. Manually operative crank means, specifically a handwheel 26, is affixed to the upper end of the shaft 25, and means 27, such as a ball and socket joint, attach the lower end of shaft 25 rotatively to a follower disc 28 adapted snugly to fit within the open end of the container 20. The container 20 is the distributing container in which the adhesive is placed by its manufacturer and purchased by the consumer, with one end thereof cut off as by means of a rotary blade opener so that the snugly fitting follower disc may slide into the container. The opposite end of the container remains closed and is provided with a plurality of spaced punctures 30 such as may be formed by driving a cold chisel or the like through the top, at the desired points. The cylindrical container holding the adhesive or other viscous substance, having an open upper end, and a closed lower end 31 provided with a plurality of punctures 30, thereby becomes an expendable portion of the dispensing apparatus.

The container is maintained in coaxial relation to the remainder of the equipment by the follower disc 28, possibly aided by locating means such as the disc shelf 18.

The shelf 18 is provided with a plurality of dispensing openings 35 which are adapted to be positioned in register with the punctures 30 in the lower end 31 of the container. A plurality of valve members 36, preferably in the form of knife blades, bear against the lower surface of the shelf 18 in shearing relation thereto, being normally maintained in position to close the openings 35. The valve members 36 are preferably mounted respectively at the ends of the arms of a spider member 37 pivotally mounted upon a pivot 38 extending vertically between the crossbar 17 and the shelf 18. A spring 40 is tensioned between one arm of the spider and a pin on shelf 18, the spring being biased normally to maintain an arm of the spider against an abutment 41 fixed to the shelf whereby the valve members are held in closing relation to the openings 35.

Means are provided simultaneously to move all of the valve members away from the openings 35, comprising a cable 45 fixed to one of the arms of the spider 37 at

one end, passing over an idler pulley 46 mounted upon one of the posts 13 and extending downward to a treadle bar 47 pivotally mounted on one of the legs 13 of the table and maintained in a movement limiting bracket 48 on an adjacent leg 13. Depression of the treadle results in all of the valve members being simultaneously moved to uncover the dispensing openings 35, whereupon pressure applied by the follower disc 23 will cause extrusion of substantially equal amounts of the substance. As soon as pressure on the treadle bar is released, the spring 40 simultaneously returns all of the valve members to closing positions, the knife edges thereof slicing through the extrusions and permitting them to drop onto the desired portions of the top tile 12. It is to be appreciated that tiles may be individually held at the position which would represent the top of the stack of tiles. Also, the globules of the substance thus extruded and severed may drop with reasonable accuracy onto successively lower uppermost tiles in the stack.

Means are associated with the movable structure 21 whereby actuation of the threaded member 25 need not be effected for each tile, comprising resilient means biased between the posts 15 and the movable structure so as to exert downward pressure upon the follower disc 23. Such means preferably comprises a pair of helical springs 50 surrounding the posts, having their lower ends respectively attached to the posts, and their upper ends respectively attached to the movable structure 21 adjacent the ends of the crossbar 22. By reason of this structure the operator may from time to time give a few revolutions to the shaft through medium of the handwheel 26 and then proceed to apply the substance to a plurality of the articles, until the springs 50 have recoiled to such an extent that they cannot exert sufficient force to extrude the substance from the container.

By reason of the foregoing structure it will be appreciated that the quantity of the substance remaining in the container at any time will always be in a confined space, thus preserving its viscosity and preventing escape of the solvent. Therefore, all of the substance will be utilized.

Having illustrated and disclosed a preferred embodiment of the present invention, it should be apparent to those skilled in the art that the same permits of modifications in arrangement and detail. We claim as our invention all such modifications as come within the true spirit and scope of the following claims.

We claim:

1. A machine for simultaneously dispensing a plurality of substantially equal quantities of a viscous substance onto articles such as acoustic tile comprising means providing a supporting surface for a stack of the articles, a pair of posts rising above opposite sides of said surface, a container supporting shelf supported horizontally between said posts, a cylindrical container adapted to hold said viscous substance supported upon said shelf, said container having an entirely open upper end and a closed lower end which is provided with a plurality of spaced punctures therethrough, said shelf having a plurality of openings therethrough adapted to register with said punctures, valve means for simultaneously opening or closing said openings, a movable structure mounted upon said posts and comprising a crossbar spanning said posts and a pair of vertical guide members telescopically associated respectively with said posts, a nut mounted on said crossbar in coaxial alignment with said container, a threaded shaft engaged in said nut, shaft rotating means fixed to the upper end of said shaft, a follower disc adapted snugly to enter said container through its open upper end, means rotatably connecting said follower disc to the lower end of said shaft, and tension spring means biased between said posts and said movable structure.

2. A machine for simultaneously dispensing a plurality of substantially equal quantities of a viscous substance onto articles such as acoustic tile comprising means providing a supporting surface for a stack of the articles, a pair of posts rising above opposite sides of said surface, a container supporting shelf supported horizontally between said posts, a cylindrical container adapted to hold said viscous substance supported upon said shelf, said container having an entirely open upper end and a closed lower end which is provided with a plurality of spaced punctures therethrough, said shelf having a plurality of openings therethrough adapted to register with said punctures, valve means for simultaneously opening or closing said openings, a movable structure mounted upon said posts and comprising a crossbar spanning said posts and a pair of vertical guide members telescopically associated respectively with said posts, a nut mounted on said crossbar in coaxial alignment with said container, a threaded shaft engaged in said nut, shaft rotating means fixed to the upper end of said shaft, a follower disc adapted snugly to enter said container through its open upper end, means rotatably connecting said follower disc to the lower end of said shaft, and a pair of helical springs respectively surrounding the upper portions of said posts, said springs being connected respectively to said posts at their lower ends and to said movable structure at their upper ends.

3. A machine for simultaneously dispensing a plurality of substantially equal quantities of a viscous substance onto articles such as acoustic tile comprising means providing a supporting surface for a stack of the articles, a pair of posts rising above opposite sides of said surface, a container supporting shelf supported horizontally between said posts, a cylindrical container adapted to hold said viscous substance supported upon said shelf, said container having an entirely open upper end and a closed lower end which is provided with a plurality of spaced punctures therethrough, said shelf having a plurality of openings therethrough adapted to register with said punctures, a movable structure mounted upon said posts and comprising a crossbar spanning said posts and a pair of vertical guide members telescopically associated respectively with said posts, a nut mounted on said crossbar in coaxial alignment with said container, a threaded shaft engaged in said nut, shaft rotating means fixed to the upper end of said shaft, a follower disc adapted snugly to enter said container through its open upper end, means rotatably connecting said follower disc to the lower end of said shaft, a plurality of valve members mounted beneath said supporting shelf and normally closing said openings, means for simultaneously moving said valve members to permit the escape of the substance from said container, and means for simultaneously returning said valve members to their normal positions.

4. A machine for simultaneously dispensing a plurality of substantially equal quantities of a viscous substance onto articles such as acoustic tile comprising means providing a supporting surface for a stack of the articles, a pair of posts rising above opposite sides of such surface, a container supporting shelf supported horizontally between said posts, a cylindrical container adapted to hold said viscous substance supported upon said shelf, said container having an entirely open upper end and a closed lower end which is provided with a plurality of spaced punctures therethrough, said shelf having a plurality of openings therethrough adapted to register with said punctures, a movable structure mounted upon said posts and comprising a crossbar spanning said posts and a pair of vertical guide members telescopically associated respectively with said posts, a nut mounted on said crossbar in coaxial alignment with said container, a threaded shaft engaged in said nut, shaft rotating means fixed to the upper end of said shaft, a follower disc adapted snugly to enter said container through its open upper end, means

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rotatably connecting said follower disc to the lower end of said shaft, a plurality of valve members mounted beneath said supporting shelf and normally closing said openings, and means for simultaneously moving said valve members to permit the escape of the substance from said container comprising a spider rotatively mounted beneath said shelf in coaxial alignment with said container, said spider having a plurality of arms respectively movable in sliding engagement with the lower surface of said shelf and normally closing said openings, treadle operated means connected to said spider and effective to arcuately move said spider to such an extent as to uncover said openings, and resilient means opposing such movement and effective to return said spider to its normal position.

5. A machine for simultaneously dispensing a plurality of substantially equal quantities of a viscous substance onto articles such as acoustic tile comprising means providing a supporting surface for a stack of the articles, a pair of posts rising above opposite sides of such surface, a container supporting shelf supported horizontally between said posts, a cylindrical container adapted to hold said viscous substance supported upon said shelf, said container having an entirely open upper end and a closed lower end which is provided with a plurality of spaced punctures therethrough, said shelf having a plurality of

openings therethrough adapted to register with said punctures, a movable structure mounted upon said posts and comprising a crossbar spanning said posts and a pair of vertical guide members telescopically associated respectively with said posts, a nut mounted on said crossbar in coaxial alignment with said container, a threaded shaft engaged in said nut, shaft rotating crank means fixed to the upper end of said shaft, a follower disc adapted snugly to enter said container through its open upper end, means rotatably connecting said follower disc to the lower end of said shaft, spring means biased between said posts and said movable structure whereby to exert pressure upon said substance, a plurality of valve members mounted beneath said supporting shelf and normally closing said openings, means for simultaneously moving said valve members to permit the escape of the substance from said container, and resilient means opposing such movement and effective to return said spider to its normal position.

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