This invention relates to an applicator device adapted for use in applying detergents or the like to surfaces, such as rugs or carpets.

The present invention constitutes an improvement over the structure shown in copending application Serial No. 832,677, filed August 10, 1959, entitled, "Applicator Machine," and assigned to a common assignee.

In that application a receptacle for liquid is shown, together with valve means for discharging liquid from the receptacle onto the surface to be treated in automatic accordance with translation of the device over the surface.

The device of the present invention is similar to that shown in the copending application, except that the structure is substantially improved as to rigidity and accuracy in valve function with fewer and less costly parts.

The accompanying drawings illustrate the best mode presently contemplated by the inventor for carrying out the invention.

In the drawings:

FIGURE 1 is a side elevational view of a structure embodying the invention;
FIG. 2 is a front elevation of the structure of FIGURE 1 with parts being broken away and in section;
FIG. 3 is a vertical section taken on line 3--3 of FIG. 2, with the handle in retracted or valve closing position;
FIG. 4 is a view similar to FIG. 3 with the handle in valve opening position and with parts broken away and in section; and
FIG. 5 is a transverse section taken on line 5--5 of FIG. 3.

As shown in the drawings, the apparatus includes a liquid receptacle 1 having a top wall with a centrally disposed opening 2 therein. Opening 2 is formed by an annular bearing flange 3 of substantial height which is formed integral with the main body of the receptacle. The diameter of opening 2 is about equivalent to the diameter of a rod-like handle 4 adapted to be received therethrough.

Handle 4 is of such length as to provide relatively easy manual manipulation of the apparatus by a standing operator. The handle must be relatively rigid, and may be tubular or solid as desired.

In the embodiment illustrated, receptacle 1 is of generally rectangular configuration and of substantially greater height than width, and may be formed of molded plastic which is reasonably rigid but slightly flexible.

The lower side wall portions of receptacle 1 are provided with a continuous offset or outwardly projecting shoulder 5 which extends around the outside thereof. Internally, a flange 6 extends downwardly from adjacent shoulder 5 to provide a continuous groove 7 between flange 6 and the outwardly offset portion of the receptacle wall.

The front wall of the device is of greater height than the rear wall.

A partition 8 is disposed within the receptacle walls and is provided with an upwardly facing groove 9 which receives flange 6, and with an upwardly projecting flange 10 fittingly received within groove 7.

Partition 8 thus forms the bottom of the receptacle. To assure a liquid-tight joint, the parts may be fused together and sealed in any suitable manner.
sure will also serve to compress spring 23 to permit lowering of the handle relative to receptacle 1. This will cause handle 4 to slide within the bearing-like walls 3 of opening 2, and stud 20 will therefore be lowered to release member 26 from seat 16.

To increase the speed with which liquid is supplied to distributor strip 12, a small slot 32 is disposed in the upper end of the boss 15 which forms opening 14. When the valve is closed, liquid from the tank can therefore fill the opening and penetrate to just behind washer 26.

By providing the seat 16 and valve member 26 so that the valve closure is made by a sealing contact of these two elements under the bias of spring 23 in a plane normal to the axis of rod 20 and handle 4, it is possible to provide for substantial manufacturing and assembly tolerances. This fact coupled with the substantial difference in diameter of rod 20 and hole 14 permits a misalignment of the rod and handle 4 in assembly that compensates for wide tolerances. This becomes important where the rigid handle 4 extends downwardly to near the valve under the guiding influence of bearing flange 3 which may not always have the identical relation with partition 8 that would provide accurate alignment between flange opening 2 and valve opening 14.

As shown in FIGS. 3 and 4, means may be provided to permit selective locking of the dispensing valve in the closed position. This locking means is actuated merely by rotating handle 4 relative to the rest of the applicator. For this purpose, the upper circular edge of bearing 3 forms a cam surface having a pair of diametrically opposed downwardly extending V-shaped grooves 33 therein. Handle 4 is provided with a pair of diametrically opposed projections 34 which may be the ends of a generally horizontal pin 35 which extends through the handle. A cover or cap 36 is mounted over the bearing 3 in any suitable manner and has an opening for receiving the handle 4.

When handle 4 is turned so that projections 34 ride adjacent the top edge of bearing 3, as shown in FIG. 3, the dispensing valve is held in closed position at all times. If the handle is turned so that projections 34 are normally above grooves 33, the valve will open upon pressing of handle 4 downwardly, and the projections will enter the grooves as shown in FIG. 4, thereby providing normal automatic operation. The projections are normally in the plane of the bearing edge.

Handle 4 can be turned by an operator in standing position, with no stooping or bending necessary.

The molds for the parts are simple and the number of parts for assembly are few, thereby greatly reducing the cost of manufacture as compared to the construction shown in the copending application.

In operation the construction is more rigid than that of the above-identified copending application, and effectively resists deformation when the operator uses two hands on the handle and bears downwardly in operation.

Any yielding of the bearing flange 3 in slight distortion under such downward pressure on the handle will not interfere with actuation of valve rod 20 and valve member 26. Thus the construction maintains alignment between handle 4 and receptacle 1 under normal operating forces.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

We claim:

1. A device of the class described comprising:
   a receptacle for liquid detergent mix and having a valve opening in its bottom and an opening in its top generally aligned with said valve opening,
   a rigid handle extending downwardly through said top opening and a member therein for axial reciprocation relative to the receptacle,
   a valve seat facing downwardly and encirling said valve opening,
   a valve closing member disposed to engage said seat to close the valve opening and to move axially away from said seat to open the same,
   said seat lying in a plane substantially normal to said valve opening,
   rigid means carrying said valve member and extending upwardly loosely through said valve opening and rigidly secured to the lower end of said handle, and
   said springs means disposed between the bottom of said receptacle and the lower end of said handle and biasing said handle upwardly to effect normal closing of said valve opening.

2. The construction of claim 1 wherein:
   said receptacle is molded of synthetic plastic material, and the top opening is integrally flanged upwardly to provide a bearing support for said handle.

3. The construction of claim 2 which includes:
   a projection extending from the said handle and normally disposed generally in the plane of the edge of the said bearing support, and
   a groove in the said edge for receiving said projection when the said handle is reciprocated downwardly, said handle being manually rotatable relative to the said bearing support to selectively position the projection above said edge or in registry with said groove.

4. The construction of claim 1 wherein:
   said first-named means constitutes a valve rod, and said spring means comprises a coil compression spring encircling said rod between the bottom of said receptacle and the lower end of said handle.

5. The construction of claim 1 in which:
   said first-named means comprises a stud threaded axially into the lower end of said handle, said valve member is a washer having a flat side engaging said seat and a diameter substantially greater than said valve opening, and
   said stud having a head at its lower end carrying said valve member.

References Cited in the file of this patent
UNIVERSAL PATENTS

1930
1,753,514 Hardie 1
1,885,997 Durham 1
Nov. 1, 1932
2,633,590 Mitchell 1
Apr. 7, 1953
2,951,256 Hulsh 1
Sept. 6, 1960