

Dec. 23, 1969

W. P. HIDDEN ET AL

3,485,562

DISPOSABLE LIQUID APPLICATOR

Filed Nov. 24, 1967

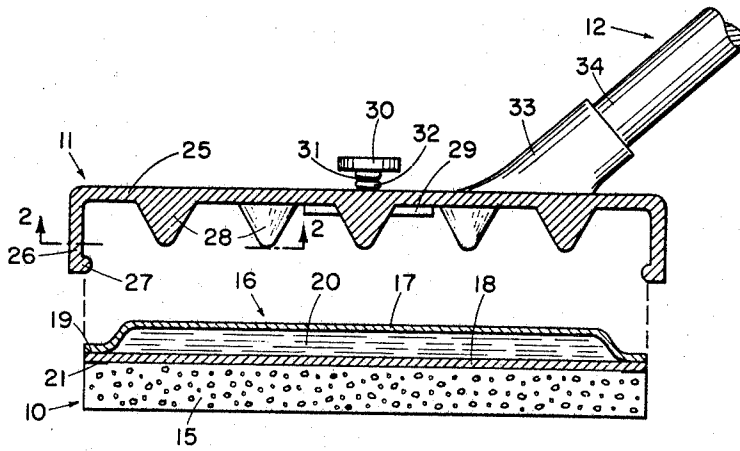


Fig. 1

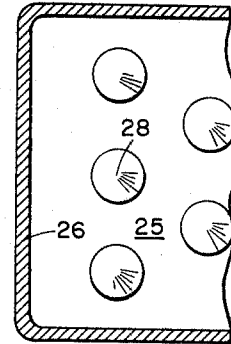


Fig. 2

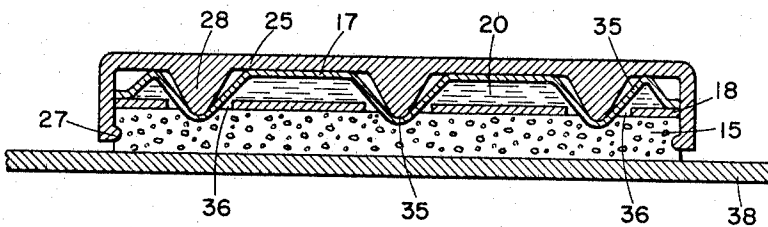


Fig. 3

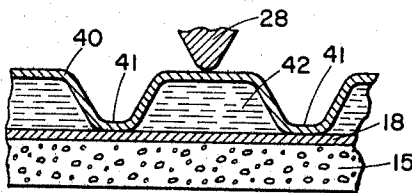


Fig. 5

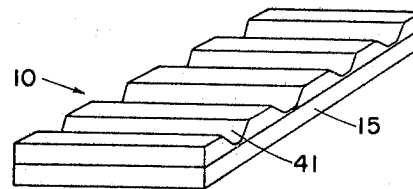


Fig. 4

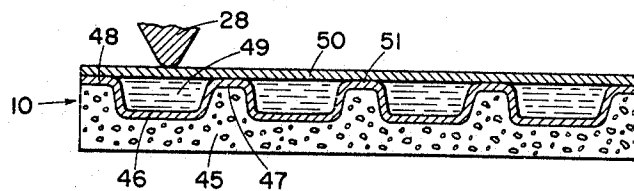


Fig. 6

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1

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DISPOSABLE LIQUID APPLICATOR

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Filed Nov. 24, 1967, Ser. No. 685,445

Int. Cl. A47I 13/17

U.S. Cl. 401—134

8 Claims

ABSTRACT OF THE DISCLOSURE

A disposable cartridge comprising an applicator pad and a reservoir containing a liquid which is to be applied to a surface. The cartridge is particularly suitable for containing a floor-treating liquid, e.g., a wax or resin emulsion. The cartridge is adapted to be affixed to a handle assembly. Means are provided to release the liquid through the porous applicator at the time it is desired to apply it.

In the case of floors and other surfaces, it is now quite common periodically to apply a coating of a protective material which is normally in the form of a liquid vehicle containing either a wax or a resin. With the evaporation of the liquid vehicle, a layer of protective wax or resin is deposited on the floor. A number of different ways have been devised for the application of such a liquid-treating material to the floor surface, the most common being to pour a quantity of the liquid onto the floor and work it around by means of a cloth, sponge, or a mop. Unless the cloth or sponge applicator is washed thoroughly, it is difficult to use it again because of solids build up in it. More recently, several automatic applicators have been devised which require the transfer of the liquid-treating material from a container, e.g., a can, into a reservoir which feeds into a porous applicator. The reservoir is normally permanently affixed to a handle and is filled from the supply container when necessary. (See, for example, U.S. Patents 2,805,435 and 3,124,828.) During those periods of time when the applicator is not in use (which is the major part of its lifetime), the residual liquid remaining in the reservoir and in the porous applicator tends to evaporate and build up solid residues on the walls, in any passages which communicate between the reservoir and porous applicators, as well as in the pores of the applicator itself. As a result, more and more difficulty is encountered in obtaining a satisfactory flow of liquid through the device during the lifetime of the applicator until a time is reached when the entire device must be discarded for a new one. It would, therefore, be desirable to have available an apparatus which is not subject to such difficulties during use and which could be relied upon to provide consistently good control over the flow of liquid onto the floor surface.

It is therefore, a primary object of this invention to provide an improved liquid applicator, and particularly one which is suitable for use in applying a liquid-treating material to floors and like surfaces. It is another object of this invention to provide an applicator having a disposable cartridge adapted to engage a handle member and then be removed therefrom after the liquid has been discharged. It is another object of this invention to provide means for applying liquid to a surface, such means not requiring the transfer of the liquid from a container to an applicator. It is still another object of this invention to provide a disposable applicator of the type described which offers the possibility of using a variety of liquids without the necessity of having to clean the applicator when the liquid is to be changed from one formula-

2

tion to another. Other objects of the invention will in part be obvious and will in part be apparent hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the constructions hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which

FIG. 1 is a transverse cross section of one embodiment of the disposable cartridge and reusable handle section shown prior to assembly;

FIG. 2 is a cross section of a portion of the reusable handle section taken along line 2—2 of FIG. 1;

FIG. 3 is a transverse cross section of the embodiment of FIG. 1 showing the engagement of the disposable cartridge with the handle section and contact of the liquid applicator with a surface;

FIG. 4 is a perspective view of another embodiment of the disposable cartridge;

FIG. 5 is a fragmentary transverse cross section of the cartridge of FIG. 4; and

FIG. 6 is a transverse cross section of a third embodiment of the disposable cartridge.

The disposable cartridge of this invention comprises a liquid reservoir, having at least a portion of the wall which defines it formed of a puncturable material, and a compressible porous applicator pad affixed to the liquid reservoir in liquid-receiving relationship therewith so that when the wall of the reservoir is punctured, liquid is transferred to the surface through the compressible porous pad. The disposable cartridge is adapted to fit into a detachable head which in turn has means for puncturing the wall of the liquid reservoir and releasing the liquid for distribution on the surface through the pad.

FIG. 1 illustrates in cross section one embodiment of the disposable cartridge and detachable head means of this invention. As will be seen, it consists in general of the disposable cartridge 10, the reusable cover 11, and the handle assembly 12. The disposable cartridge 10 in this embodiment is formed of a porous compressible applicator pad 15 to which is attached a liquid reservoir 16. This liquid reservoir 16 in turn is formed of an upper thin flexible wall 17 sealed to a lower thin brittle puncturable wall 18 along the edges 19. The liquid 20 to be applied is contained within the sealed reservoir which in turn is attached along its edges 21 to the pad 15.

The releasable and reusable cover 11 comprises a rigid top plate 25 having side walls 26 which may have a slight inner lip 27 for effecting a tight fit with the disposable cartridge. A number of puncture points 28 extend from the internal wall of the cover plate 25. Preferably, these are staggered in their arrangement as illustrated in FIG. 2.

If desired, there may also be some form of ejection means associated with the reusable cover and handle assembly. In FIG. 1 this is shown to comprise an internal ejection plate 29, which is attached to an externally positioned pressure plate 30 through a pin 31. A spring 32 maintains the pressure plate in its normal upward position. However, when pressure is applied to the pressure plate, the ejection plate 29 forces the disposable cartridge out of engagement with the reusable cover assembly. The handle assembly comprises a connecting member 33, affixed either permanently or in rotating relationship with the cover plate 25, and the handle 34.

FIG. 3 illustrates the manner in which the liquid from the reservoir 16 is released into the applicator pad 15 for application to a surface when the disposable cartridge is engaged with the reusable cover. Inasmuch as the top film 17 defining the liquid reservoir is made of a thin

flexible and somewhat elastic resin material, the film 17 will stretch and follow the contour of the puncture points 28 to form around them a stretched, but liquid-impermeable, film 35. However, since the bottom film 18 defining the reservoir is of a brittle material, the puncture points 28 will pass through the film to create fluid passages 36 for conduction of the liquid 20 into the pad 15 and subsequent application to a surface such as floor 38.

FIGS. 4 and 5 illustrate a modification of the disposable cartridge of FIG. 1. In this modification the flexible top film 40 is sealed to the bottom brittle film 18 along a series of parallel narrow furrows 41 to form a configuration having a number of individual liquid pockets 42, each of which will have one or more puncture points 28 aligned therewith. The disposable cartridge of FIGS. 4 and 5 is suitable for use in the cover and handle assembly illustrated in FIG. 1. The apparatus comprising the cartridge of FIGS. 4 and 5 and the cover and handle assembly of FIG. 1 operates in the same manner as illustrated in FIG. 3.

FIG. 6 illustrates another modification of the disposable cartridge in which the applicator pad is contoured so as to define a plurality of individual liquid receptacles. The contoured surface of the pad, consisting of grooves 46 and narrow lands 47, is covered with the brittle or puncturable film 48 to retain the liquid within the individual receptacles 49 until it is desired to release it. The flexible film 50 is stretched over the peaks 47 and sealed to the film where contact 51 is made with the brittle film 46. This cartridge is used in the same manner as that shown in FIGS. 1 and 4 and, as in the case of FIG. 4, there is one or more puncture points 28 aligned with each of the receptacles 49.

The upper wall member defining the liquid reservoirs in the embodiments of FIGS. 1-6 should be formed of a plastic film material which is flexible and capable of experiencing some stretching or extension to permit it to be indented, as shown in FIG. 3, without breaking. Thus it is preferable to use an elastomeric or stretchable material such as a rubber (natural or synthetic), polyisobutylene, polyethylene terephthalate or polyethylene, and the like. It may be desirable in some instances to use multiple thin layers of a flexible film as the top member to insure integrity of this member. The lower wall member must, in contrast, be capable of being readily punctured and is, therefore, preferably formed of a brittle or easily rupturable material such as cellulose acetate, a brittle polystyrene, aluminum foil, and the like. A laminate of aluminum foil and paper adhered with a suitable resin adhesive is particularly well suited for forming the bottom member. The foil is coated with a thermoplastic hot melt coating to seal any openings in it and to provide means for sealing the top member to it along the edges of the reservoir. Inasmuch as it may be desirable to store the cartridges over an extended period of time, the film materials forming the walls of the reservoir should be unreactive with the liquid contained therein and remain liquid impermeable for the desired storage period.

The applicator pad 15 is preferably constructed of a material which is somewhat compressible and which is not wetted to any appreciable extent by the liquid passing through it. It must also, of course, have sufficient porosity to permit the liquid to flow from the reservoir to the surface to be treated at a rate which permits an even distribution of the liquid. Suitable materials for the applicator pad include, but are not limited to, foamed polyurethane, cellulose acetate, felt, and the like.

The reusable handle assembly may be constructed of any suitable material, a molded plastic being particularly well adapted for forming the cover having the puncture points.

The disposable cartridges may, of course, be made in any convenient size which will be determined by the area of the surface to be treated and the desired thick-

ness of liquid coating to be applied. Since a fresh cartridge may be used with each treatment, there is no problem of clogging in the applicator pad, and no large quantity of liquid must be stored for periodic transfer to an applicator.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

We claim:

1. A disposable cartridge suitable for engagement with a handle assembly to apply a liquid to a surface, comprising in combination

(a) liquid reservoir means comprising a thin flexible, extensible top member and a puncturable bottom member, said top and bottom members being sealed around the edges and defining at least one liquid-tight volume therebetween, whereby when a pressure-applying surface means having puncture means depending therefrom is brought into pressure-applying contact with said top member said top member remains intact and said bottom member is punctured to release said liquid; and

(b) porous applicator pad means affixed to said liquid reservoir means in liquid-receiving relationship therewith when said bottom member is punctured.

2. A disposable cartridge in accordance with claim 1 wherein said top member has a plurality of narrow furrows engaging said bottom member and sealed thereto, thereby providing a plurality of liquid-tight volumes in said reservoir means.

3. A disposable cartridge in accordance with claim 1 wherein said bottom member has a plurality of narrow lands engaging said top member and sealed thereto, thereby providing a plurality of liquid-tight volumes in said reservoir means.

4. A disposable cartridge in accordance with claim 1 wherein said top member is a polyethylene film and said bottom member is a laminate of aluminum foil and paper, the aluminum foil having a resin coating.

5. A disposable cartridge in accordance with claim 1 wherein said porous applicator pad means is formed of foamed polyurethane.

6. An apparatus for applying a liquid to a surface, comprising in combination

(a) a disposable cartridge comprising

(1) liquid reservoir means comprising a thin flexible, extensible top member and a puncturable bottom member, said top and bottom members being sealed around the edges and defining at least one liquid-tight volume therebetween, whereby when a pressure-applying surface means having puncture means depending therefrom is brought into pressure-applying contact with said top member said top member remains intact and said bottom member is punctured to release said liquid; and

(2) porous applicator pad means affixed to said liquid reservoir means in liquid-receiving relationship therewith when said bottom member is punctured; and

(b) detachable handle assembly means adapted to engage said cartridge and to provide said pressure-applying surface means having said puncture means.

7. An apparatus in accordance with claim 6 wherein said detachable handle assembly means comprises

5

6

- (1) a cover member as said pressure-applying surface means, said cover member having sides adapted to engage and hold said cartridge and a plurality of puncture points as said puncturing means, and
(2) a handle attached to said cover member.

8. An apparatus in accordance with claim 7 including means associated with said cover member for ejecting said cartridge.

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LAWRENCE CHARLES, Primary Examiner

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