May 18, 1965 G. S. WORCESTER 3,183,543

DISPOSABLE SANITARY WASHING ENVELOPE

Filed Oct. 23, 1963

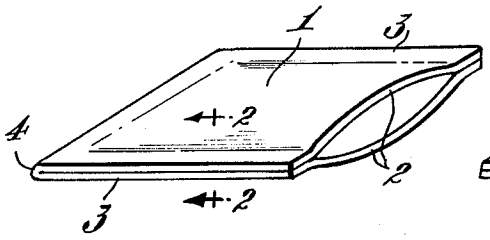


Fig. 1

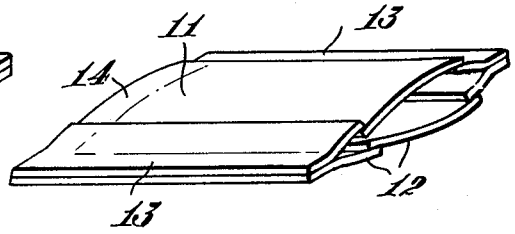


Fig. 3

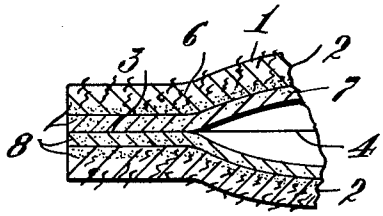


Fig. 2

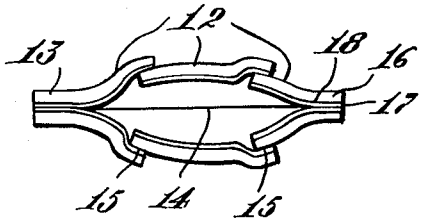


Fig. 4

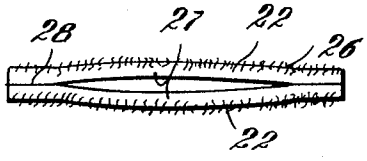


Fig. 5

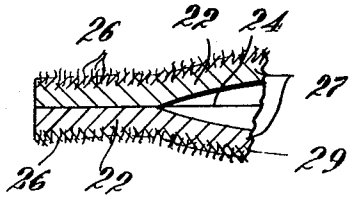


Fig. 6

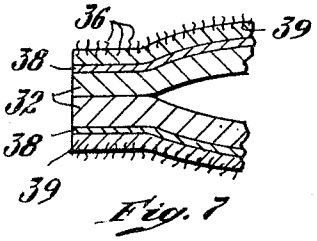


Fig. 7

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DISPOSABLE SANITARY WASHING ENVELOPE

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This invention relates to a paper envelope adapted to be worn on the user's hand while cleaning floors, bathroom sinks and bowls or the like.

Mitten-like cleaning articles have been proposed with a detergent or soap impregnant, sometimes with a waterproof lining, to permit the wearer to immerse the mitten in unsanitary liquids which dissolve the detergent allowing the wearer to clean floors and bowls without exposing the wearer's hand to unsanitary conditions.

Notwithstanding such proposals, an envelope or mitten which is safely disposable, attractive to the user and commercially feasible, is still needed. A housewife will want the mitten to generate its own detergent action and to protect her hand during use. She will not want to use a mitten more than once for cleaning unsanitary bowls. She will want to dispose of the mitten while wet, preferably in a toilet bowl, but without the danger of clogging sewage pipes with the mitten.

Thus the object of the invention is to provide a washing envelope or mitten, which preferably requires no additional supply of detergent, which protects the wearer's hand in use, which is easily disposable and which is simple and economical to manufacture.

According to the invention an envelope comprises opposed webs of flexible sheet material joined by a bond at one or more of their edges, each said sheet comprising a zone of slowly soluble material which is temporarily impervious to water, whereby the envelope may remain intact and watertight for a limited period until the aforesaid zone is dissolved.

The slowly soluble layer of the sheets may be exposed to the exterior of the envelope so that it disintegrates on application of water to its exterior. Or the envelope may be impervious to water from the outside but softenable by water admitted to the inside.

For the purpose of illustration typical embodiments of the invention are shown in the accompanying drawing in which:

FIG. 1 is an isometric view of one form of envelope according to the invention;

FIG. 2 is a section on line 2—2 of FIG. 1;

FIG. 3 is an isometric view of another form of envelope;

FIG. 4 is an end view of the envelope of FIG. 3;

FIG. 5 is an end view of a further form of envelope; and

FIGS. 6 and 7 are sections like FIG. 2 of still further forms of envelope.

As shown in FIGS. 1 and 2 one form of envelope 1 comprises a laminated sheet 2 folded at one end 4 and sealed along its lateral edges 3 with the other end open. The paper sheet 2 is formed of a thick, nappy outer paper layer 6 and a thin inner paper layer 7. Adjacent zones 8 of the inner and outer layers 7 and 6 are impregnated with a slowly water-soluble adhesive which bonds them together. The envelope so far described may be made as follows.

Example I

Outer layer 6–19 pound, embossed white, bleached, kraft paper toweling.
Inner layer—12 pound tissue paper.
Adhesive formulation:

Hide glue	40.0 parts.
Glycerine	11.0 parts as plasticizer.
Sorbitol	22.0 parts as plasticizer.
Formaldehyde	0.1 part as preservative.
Water	126.9 parts.

A solution of the adhesive is thoroughly stirred and heated to 180° F. Strips of the outer and inner layer are cut to rectangular or glove shape approximately 6 inches by 24 inches. An excess of the adhesive is applied to the outer layer and spread in an even, continuous layer with a thickness equivalent to the distribution by a standard No. 20 or 32 paper coating rod. The outer and inner layers are then pressed or rolled together and so bonded with the fibres of the outer layer penetrating the adhesive coating, but without causing the adhesive to penetrate entirely through the inner layer. The adhesive is dried, preferably in a warm dry box, or by standing at room temperature for twelve hours. The laminated sheet is folded on its transverse centerline to envelope form and the two edges 3 of the sides of the envelope adjacent the folded end are joined by a bond of the above adhesive formulation applied along a ¼ inch strip at the edges 3. While the adhesive is wet, opposed edges are pressed together and allowed to set.

An envelope so made does not have adhesive on the inner or outer surfaces. When partially immersed in water with the open end out of water, the adhesive layer dissolves slowly from the outside inwardly. With an adhesive layer of the thickness described, water does not penetrate the adhesive layer for about two to four minutes, and the user's hand is protected for this period. Longer periods of protection are provided by increasing the thickness of the adhesive layer. The envelope withstands rubbing for such limited periods. When dropped from the hand into water, the inner and outer fibrous layers soften, the adhesive dissolves nearly entirely, and the bonded edges and inner and outer paper layers loosen and separate permitting safe flushing of the disintegrated envelope.

Example II

To the adhesive formulation of Example I, is added 2.4 parts of a detergent or wetting agent such as octyl phenoxy polyethoxy ethanol with an average polyoxyethylene chain length of 9 to 10. When the envelope is immersed in use, dissolution of the adhesive layer releases the detergent which migrates through the outer fibrous layer for detergent action.

Example III

To the adhesive formulation of Example II, are added 0.245 part of a quaternary ammonium salt, as a cationic germicide (for example, a 50% aqueous solution of alkyl dimethyl benzyl ammonium chloride with an average molecular weight of 358), and 0.123 part of perfume.

As shown in FIGS. 3 and 4, the foregoing examples of adhesive and paper may be used to make a more extensively disintegrating envelope 11. First, outer and inner

fibrous paper layers 16 and 17 are joined by an adhesive bond 18 to form relatively narrow strips 12 like the laminated sheets 2 of FIGS. 1 and 2. A plurality of such strips (three are shown) are bonded at overlapping lateral edges 15 to form a composite sheet. The bond is made by applying adhesive between the overlapping edges, as the edges 3 in FIGS. 1 and 2 were scaled. Similarly, the lateral edges 13 and end edge 14 of two composite sheets are joined to form an envelope.

When immersed, such an envelope is waterproof for a limited period and then disintegrates not only at its edges 13 and 14, but also at the edges 15, leaving short narrow strips of softened paper which are easily and safely flushed.

Example IV

An envelope is prepared according to Examples I, II or III using a base sheet of non-woven fabric instead of paper toweling. Such a fabric may comprise an open, fluffy or felted sheet approximately 1 mm. thick, composed of natural or synthetic fibres joined with a water-soluble bond.

Example V

A sheet of polyvinyl alcohol of thickness in the order of 10 to 25 mils is softened on one side by lukewarm water. Fine, dry paper fibres are then blown against the softened side and partially embedded in the softened side to form a flocked surface. The sheet is then dried and passed over a spray or surface bath of 37% aqueous solution of formaldehyde so that only the flocked surface receives an excess wetting with the formaldehyde. The excess is immediately removed allowing the remaining formaldehyde to react with a thin superficial zone 29 of the polyvinyl sheet at the flocked side. This superficial zone 29 is thereby insolubilized, while most of the thickness of the sheet remains water soluble. Unreacted formaldehyde is then washed from the flocked fibres with water, and the fibres are impregnated with the detergent of Example III and dried.

As shown in FIGS. 5 and 6, sheets 22 prepared as above are cut to envelope shape as in FIG. 3. The water-soluble sides 27 of two sheets are opposed with the outer sides having the flocked fibres 26 embedded in the insolubilized zone 28. The side edges 28 and end edge of the opposed sheets are then bonded together to complete the envelope. The bond may be made by dissolving the edge area on the inner water-soluble surface of the sheets with water, by applying a water solution of polyvinyl alcohol to the edge areas, or by sealing the edges under pressure with gentle heat, polyvinyl alcohol being thermoplastic.

A polyvinyl alcohol envelope prepared according to Example V affords greater waterproof protection by virtue of the insolubilized zone, but remains easily disposable. When the envelope is entitrely immersed in water after use, the previously protected soluble thickness 27 is dissolved from the inside outwardly until only the very thin insolubilized zone 28 remains. The edge bonds disintegrate in this process and the residue of the envelope is easily flushed.

Example VI

As shown in FIG. 7 an envelope similar to that of

FIGS. 6 and 7 is formed of polyvinyl alcohol sheeting prepared as follows.

A sheet 32 of polyvinyl alcohol is water insolubilized with formaldehyde in a zone 38 as in Example V, leaving the greatest thickness 37 water soluble. Over the insoluble zone 38 is coated a layer 39 of water soluble polyvinyl alcohol, which while tacky is impregnated with detergent and flocked with fibres 36. The water solubility of the inner layer may be increased by impregnation with the wetting agent of Example III.

It should be understood that the foregoing examples are for the purpose of illustration only and that the present invention includes all modifications and equivalents within the scope of the appended claims. For example the insolubilized zone of Examples V and VI may be omitted, and the envelope formed as in Examples I to IV after one surface of the polyvinyl alcohol sheet is flocked.

I claim:

1. An envelope comprising opposed webs of flexible sheet material joined by a bond at one or more of their edges, said webs being substantially water impenetrable from the outside, and the inside of said sheets being water softenable to permit disintegration of the envelope after water is admitted inside the envelope.

2. A sanitary washing mitten comprising two plies of sheet material joined by a bond at one or more of their edges to form an envelope open at one end to receive a user's hand, each said ply comprising a zone of a slowly soluble material at least temporarily impervious to water, whereby the user's hand is protected from external liquids for a predetermined period after water is applied to the envelope, whereafter said slowly soluble material softens and permits disposal of the mitten in a sewage system.

3. A mitten according to claim 2 wherein said sheet material having said temporarily water impervious zone comprises a water disintegrable non-woven material extending outside said zone to the exterior of the mitten.

4. A mitten according to claim 2 wherein said sheet material comprises a temporarily waterproof sheet flocked with fibres at the exterior of the mitten.

5. A sanitary washing mitten comprising two plies of sheet material jointed by a bond at one or more of their edges to form an envelope open at one end to receive a user's hand, each said ply comprising a zone of a slowly soluble material at least temporarily impervious to water, whereby the user's hand is protected from external liquids for a predetermined period after water is applied to the envelope, whereafter said slowly soluble material softens and permits disposal of the mitten in a sewage system, each said ply comprising an external fibrous surface and said zone being located inwardly of the fibrous surface and extending entirely around the interior of the mitten receiving the user's hand.

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