Jan. 12, 1943. F. W. TULLY 2,308,405

CLEANSING ARTICLE

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Fig. 1

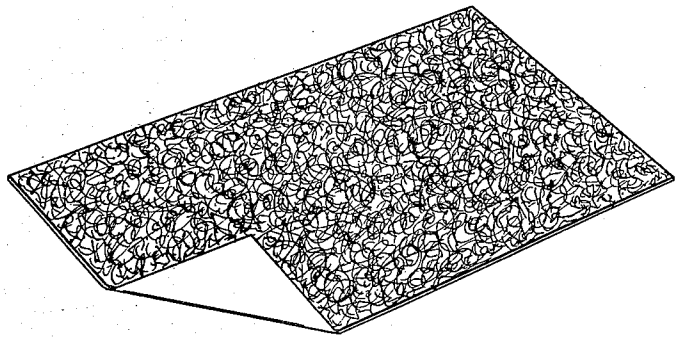
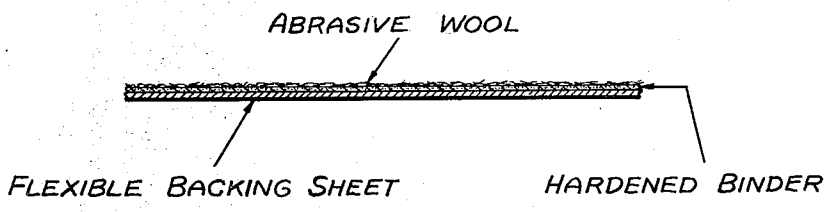


Fig. 2



INVENTOR.
Francis W. Tully
BY
H. F. Kirkpatrick.
ATTORNEY

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CLEANSING ARTICLE

Francis W. Tully, Brookline, Mass.

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2 Claims. (Cl. 15—209)

This invention relates to a novel cleansing, abrasive and polishing means. Specifically the invention is a combination of an abrasive wool, for example steel wool, together with a cementitious binder of resin carrying a water soluble soap and retaining the abrasive wool on a backing of thin flexible sheet material.

One of the objects of the invention is to provide an improved cleanser for metal articles, particularly for household utensils, which shall have superior qualities as a rapid cleanser producing an excellent finish, which, because the hands of the user need not be brought into close or continuous contact with steel wool is therefore easier on the hands, which provides disposable units intended for single use, and which may be dispensed from packs of individual sheets or from continuous rolls and thereby always presents an unused and neat appearance, thus overcoming a valid objection to steel wool as contemporaneously used, namely, being intended for repeated use and undergoing repeated wettings it generally presents a messy and often rusty appearance throughout its prolonged disintegration.

Steel wool as fabricated for cleansing purposes is generally a spongelike mass of long, wiry fibres closely intertwined and fashioned into cushion-like pads. Where such a pad consists of steel wool alone, it has a high friction coefficient and it leaves a scarred and dull finish on metal. In its simple state, steel wool is also deficient in capacity to remove grease residues. Hence, has developed the practice of combining soap with steel wool both as a lubricant and as a detergent. In some cases the soap is provided as a separate unit. Another practice is to coat the long fibres with a soap compound. All such pads are intended for repeated use. To overcome the effect on the hands of vigorously grasping a mass of steel wool various devices have been developed, including handles and the like.

In the drawing illustrating the preferred embodiment of my invention:

Fig. 1 is a perspective view of my improved cleansing article with a corner turned back to illustrate the uncoated back side and which may be further used for finger protection, and

Fig. 2 is a vertical cross-section of the product further illustrating the flexible backing sheet, adhesive material coating (hardened binder) with abrasive wool partially embedded therein.

The essential features of a preferred embodiment of my invention may be described as follows: Instead of the customary pad I provide a paper backing. Instead of a thick cushion of long, felted or intertwined fibres I provide a thin spread of finely comminuted steel wool. These more or less discrete fibre-like particles are firmly and relatively permanently held to the backing by a cementitious binder upon which they are deposited. This cementitious binder medium instead of being completely water-soluble is only partly so, or may be insoluble, in either case holding the steel particles sufficiently firm and long enough to function satisfactorily. Some type of detergent is essential for a completely satisfactory cleansing article for kitchen utensils, but a soap in an amount adequate for the present purpose, when combined chemically with a resin cement, weakens the cement so that when wet and under the stresses to which it is exposed in the cleansing operation, it fails to hold the steel wool particles firmly to the backing. Therefore, I effect a mechanical combination of a water-soluble soap and a water-insoluble cement to constitute the cementitious binder. To a suitable resin, which may be vinyl acetate reacted with butyl aldehyde in a solvent which may be isopropyl alcohol I add, if desired, powdered soap. In the cleansing operation, however, the soap dissolves in the water whereas the cement remains intact—holding the steel wool particles sufficiently firm and long enough to function satisfactorily.

A further innovation is that I provide a unit primarily intended for single use which as has been pointed out has advantages over a unit intended for repeated use.

From the foregoing outlines it will be apparent that my invention is a radical departure in the art of metal cleansers and provides new and useful improvements therein.

While I prefer to use creped or wrinkled paper tissue for the lacking, a paper with superior wet strength independent of the additional wet strength imparted by the cement coating, for example the type of water-resistant paper used in good quality paper towels, I may use other thin flexible sheet material for backing; for example, woven fabrics, pressed or extruded materials, metal foil, or films or synthetic compositions of matter. Whereas the felting quality of steel wool fibres is an essential in the formation of the conventional steel wool pad, this very quality presents difficulties which have to be overcome in providing a thin, uniform spread of steel wool as comprehended herein. Notwithstanding the length of the fibre-like steel wool particles as employed in this invention they form lumpy

masses if intermingled. And these aggregations occur in the dry state as well as when mixed in solutions. This difficulty, I found, may be overcome by comminuting the steel wool in situ. And such comminuting may be accomplished, for example, by any mechanical action which simulates that of a bunch of steel wool held in one hand and vigorously rubbed against a similar bunch in the other hand. In choosing the grade of steel wool I prefer the grade known as No. 1 fine. For kitchen utensils and quality metal objects a finer grade known as No. 0 is currently used in the pad type cleansers, but my formulation permits a coarser grade with its greater and more rapid abrasive efficiency to be used with satisfactory results and at lower cost.

An approved procedure for making the complete unit is as follows. Any one of a number of different type paper coating machines may be adapted to the purpose when combined with additional means for comminuting and depositing the steel wool simultaneously, or nearly so, with the application of the binder medium to the backing. For example, I may group a series of enclosed toothed rolls at a point located close to and following the doctor blade or other spreading agency of the coating mechanism. Steel wool in its original form is fed into the rolls which tear and break up the fibres which then are caused to fall on an oscillating screen immediately below the toothed rolls and immediately over the paper tissue or other thin flexible material as it emerges coated with the binder. The screen is coarse enough to allow particles of the desired size to sift through, for example, 8–20 mesh to the inch. Such steel wool as does not pass through the screen accumulates until it is picked up by the toothed rolls and still further broken down. The backing, now coated with the cement binder and steel wool particles passes on to a core upon which it is rolled in conjunction with a pressure roll. At this stage the steel wool particles which have dropped lightly are pressed into the binder medium but nevertheless are only partly coated. The pressure supplied, however, is sufficient to cement or bind them firmly to the backing. The general appearance is that of a thin, stiff fuzz. In the usual manner the wound core may be cut into small rolls.

Preferred formulations of the cement binder are as follows:

Example I

	Lbs.
Vinyl acetate reacted with butyl aldehyde	10
Isopropyl alcohol	160
Soap powder	5

The vinyl resin is first dissolved in the isopropyl alcohol and the soap powder is then added and mixed until well dispersed.

Example II

	Lbs.
Ethyl cellulose	10
Isopropyl alcohol, ethyl alcohol or acetone	160
Soap powder	5

Example III

	Lbs.
Ethyl cellulose	10
Isopropyl alcohol	160
Mineral wool	5
Foaming type colloidal silica	½
Powdered soap	5

As with the preceding examples, the resin is first dissolved in the alcohol and then the other ingredients are added and mixed until well dispersed. In the last example the mineral wool is mixed in and broken up with the other ingredients and applied as a unitary layer therewith.

The foregoing formulae are given as examples only. Other resins in solvents that are not at the same time solvents for soap or soap powder may be used, for example, other types of vinyl resins, cellulose esters and ethers and their derivatives, and alkyd resins, all of which for convenience are herein classed as resins.

In any case, I may add a suitable plasticizer, for example, dibutyl phthalate, although where the resin used provides a flexible film as is the result with both Examples I and II, I prefer no plasticizer. In any case, I may use a combination of resins.

For convenience in the specification and certain claims hereof, the expression "abrasive wool" is used and is intended to include other functionally equivalent twisted or coiled fibres, filaments, or strands of various metals or even non-metals having physical characteristics suitable as a substitute for the metal wool preferably employed herein, for example mineral wool. As herein set forth, I preferably reduce my abrasive wool to relatively short lengths of the order of ⅛"–¼", but they may be materially shorter or longer so long as they can be applied in a relatively thin layer and be satisfactorily held by the binding medium.

I claim:

1. As a new cleansing article, a thin flexible backing sheet having on one surface thereof a thin layer of hardened water-resistant adhesive material including therein a water-soluble soap and a thin layer of abrasive wool held to said backing sheet by said adhesive material.

2. As a new cleansing article, a thin flexible backing sheet having on one surface thereof a thin unitary layer of hardened water-resistant adhesive material including therein a water-soluble soap and having incorporated in said layer abrasive wool particles.

FRANCIS W. TULLY.