

August 8, 1933

THE CARE OF FLOORS

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I. INTRODUCTION

The following information, although it was not gained by an experimental study, was gathered from reliable sources and experience, and has been reviewed by various authorities on the maintenance of floorings.

II. PRECAUTION

Gasoline, turpentine, acetone, and many other volatile organic solvents are very flammable. Care should be taken in using these solvents or preparations containing them to have good ventilation and to avoid open flames or smoking in the rooms or other spaces. Oily and greasy rags should be immediately destroyed after using or kept in closed metal containers. Animal and vegetable oils are the most likely to cause spontaneous combustion.

III. WOOD FLOORS

Unfinished wood floors should be mopped or scrubbed with warm water and a mild soap. Scouring with powdered pumice or steel wool may be desirable in some cases. A solution of trisodium phosphate, sodium metasilicate (about 1/2 oz. per gallon of water), or washing soda (about 2 oz. per gallon of water), may be used for cleaning oily or greasy floors. After using soap or other cleaning agent, the floor should be thoroughly rinsed off with clear water and wiped as dry as possible. It is advisable to scrub a small area at one time and to avoid flooding the floor with cleaning solution or rinse water. Strong solutions of soaps, alkalis, alkaline salts, and the too free use of water may darken wood and may in time soften it and raise the grain. Oak floors are readily darkened by strong alkaline solutions. Where wood is badly stained or discolored, bleaches (such as oxalic acid solution; oxalic acid is a poison if taken internally) may be used, or the floor may be scraped or machine sanded.

Varnished and shellacked floors should be dusted clean with a soft brush or dry mop, and then rubbed with an oiled mop or a cloth slightly moistened with floor oil, kerosene, or furniture polish. In general, varnished and shellacked surfaces should not be treated with water, but if badly soiled they may be wiped with a mop or cloth wrung out of warm, slightly soapy water, then with a rag or mop moistened with clear water, wiped dry at once and polished with an oiled mop or cloth. The appearance of badly worn varnished wood may be improved by rubbing with a floor wax.

Oiled floors and painted floors should be swept with a soft brush and then rubbed with an oiled mop or cloth. Occasionally, they may be washed with slightly soapy water, rinsed off with a wet cloth or mop, wiped dry and then polished with an oiled mop or cloth.

Waxed floors may be cleaned with a soft brush or mop free from oil since oil softens the wax. The film of dirt and wax which darkens the surface may be removed with a cloth wrung out of warm soapy water. The use of a rag moistened with gasoline or turpentine would be a better and more rapid procedure; however, these liquids are very flammable and care should be taken to avoid having open flames in the rooms. Gasoline and turpentine brighten as well as clean the surface, whereas water dulls and whitens wax. If a water-cleaning method has already whitened a waxed floor, the luster and color may be restored by rubbing with a woolen cloth or a weighted brush; if necessary a little wax may be applied. Many kinds of spots on waxed floors may be removed by rubbing with a little turpentine or gasoline and refinishing with a very thin coat of wax. The entire coating of wax (and dirt) can be removed from wood floors by rubbing first with number 00 steel wool dipped in gasoline or turpentine and then with a soft cloth, after which the floor may be refinished.

Varnish or paint can be removed from a wood floor by scraping and planing, or by applying a paint and varnish remover. The first method, although tedious and laborious, is the better and is necessary if the floor has been stained. After a floor has been scraped, planed, and sandpapered, it can be finished as though it were new.

Removing paint or varnish from floors with paint and varnish removers must be done carefully so as not to damage the finish on baseboards and moldings. The commercial "solvent type" of paint and varnish removers are satisfactory for this purpose and are labeled with instructions for using. A solvent type of paint and varnish remover may be prepared as follows: Dissolve 3 parts of paraffin (in shavings) in 50 parts of benzol, then add 25 parts of denatured alcohol and 25 parts of acetone.

After this mixture has been applied to the surface with a brush and allowed to stand for a few minutes, the paint or varnish will soften so that it can be scraped off with a putty knife or rubbed off with steel wool or excelsior. When a putty knife is used as a scraper it will prove more effective if the end of the blade is ground to a sharp edge. By holding the putty knife in a vertical position and scraping across the grain of the wood, there is no danger of splintering the floor. This paint and varnish remover and others of this type should be used only where there is good ventilation and no open flame of any kind, as they contain highly flammable materials.

Caustic soda or household lye solutions are also used for removing paint and varnish, but should not be used on oak floors. These solutions should be handled with care and not allowed to come in contact with the skin, clothing or surfaces other than the one being treated. Rubber gloves should be worn. The caustic

soda or lye may be dissolved in plain water and the solution applied while hot, but better results will be obtained if the caustic soda is mixed with a starch solution, such as is used in starching clothes. About 3 or 4 tablespoons of caustic soda are generally added to one part of the starch solution. This mixture is applied while hot to the floor, using a cotton swab, a fiber (not bristle) brush, or a long-handled scrubbing brush. After a few minutes the softened paint or varnish may be scraped or rubbed off. The floor should then be washed several times with clear water, allowed to dry thoroughly, sandpapered or rubbed smooth, and dusted before it is refinished.

If shellac varnish alone has been used on a floor, it can be removed by flooding a small area at a time with denatured alcohol and, after a few minutes, rubbing with steel wool, or scraping as above.

In refinishing an old wood floor, it is first made as tight, level, and smooth as possible. It may need to be planed, sandpapered or rubbed down with steel wool. Any remnants of tacks must be drawn or driven below the surface. Then scrub the wood with hot water and soap or other detergent and rinse with clear water. If the wood is badly stained, spread over it a bleach solution made by dissolving a teaspoon of oxalic acid (poison) in a cup of hot water, and let stand overnight. Then thoroughly rinse the floor with clear water to remove all of the bleach (and cleaning agents) and let dry. The thoroughly dried floor may be stained, varnished, oiled, painted, or waxed. After applying the first coat of finish, it may be necessary to fill cracks and holes with a commercial "crack filler" colored to match the floor.

Removing old finishes from wood floors and refinishing them is hard work and in most cases it would probably be more satisfactory and economical to have this work done by an expert, who has the proper tools and knows just how to treat different woods.

After cleaning and drying, wood floors are generally waxed. Floor wax should be applied in very thin coats and thoroughly rubbed with a heavy waxing brush or motor driven brush, or a heavy block wrapped in burlap or carpet. In preparing a new or refinished floor for waxing, it is common practice to apply a coat of shellac varnish or other quick-drying varnish before waxing. If this is done it is better to have a very thin coating of shellac, as thicker coatings are apt in time to crack or peel, which will necessitate complete refinishing. The wax can be applied directly to close-grained woods such as maple or pine, or to such open-grained wood as oak, if a "silicate wood filler" is first applied. This treatment requires more waxing, and therefore more labor, in the original job, but the finish is likely to be more durable. However, floors finished in this way often darken more readily than if the wax is applied over a thin coat of shellac.

IV. FLOOR WAXES OR POLISHES.

The following formulas, given in Bureau of Standards Letter Circular No. 275, furnish good floor waxes or paste polishes:

In making either of the following waxes be very careful to heat only by setting the vessel containing the waxes in hot water and to have no flames in the room, since both gasoline and turpentine are very flammable.

(1) <u>Material</u>	<u>Parts by weight</u>
Carnauba wax	2
Ceresin	2
Turpentine	3
Gasoline (sp. gr. about 0.73)	3

Melt the waxes by heating in a vessel placed in hot water, add the turpentine and gasoline and cool the mixture as rapidly as possible, while vigorously stirring to produce a smooth creamy wax.

(2) Turpentine	1 pint
Beeswax	4 ounces
Aqua ammonia (10 per cent strength)	3 fluid ounces
Water	about 1 pint

Mix the beeswax and turpentine and heat them by placing the vessel in hot water until the beeswax dissolves. Remove the mixture from the source of heat, add the ammonia and the water, and stir vigorously until the mass becomes creamy. This wax should be applied lightly on varnished or shellacked floors and any excess wiped off at once, as the ammonia may attack the varnish or shellac. When this wax is used on unfinished oak flooring, the ammonia may cause a slight darkening of the wood.

The newer water-wax emulsions, commonly called non-rubbing liquid waxes, are now widely used on wood, cement, linoleum, rubber tile, cork, asphalt tile, mastic, and other floorings. Many of these preparations dry rapidly and require little or no polishing. These water-wax emulsions usually consist of carnauba wax (and other waxes) dispersed in a water solution of soap. Sometimes emulsifying agents other than soap are used. A small amount of resins is often used in preparing these emulsions. Synthetic as well as natural products may be used in some of these preparations. A simple carnauba wax-soap-water emulsion may be prepared for experimental purposes as follows:

Dissolve 1 part by weight of castile soap in 16 parts of clean, soft water, and heat the solution to boiling. Add to the boiling soap solution with constant stirring 4 parts by weight of

a good grade of carnauba wax (cut into small pieces). When a smooth homogeneous emulsion is obtained, cool to a temperature of 135°F by quickly adding, with constant stirring, the necessary quantity of cold water. (This should take about 14 to 16 parts more of water). Let cool, filter through cheese-cloth, and stir in about 0.5 per cent of formaldehyde as a preservative. The product so obtained should be of the color and consistency of cream. A thicker or thinner product may be made by decreasing or increasing the quantity of water used, taking care to maintain the given ratio between soap and wax. This wax mixture may require polishing or buffing after drying in order to obtain a glossy surface.

The following information and formulas for the preparation of a "triethanolamine-carnauba wax dry-bright polish" have been furnished by a manufacturer:

"Shellac has been incorporated in this polish to cut down the slipperiness of a straight carnauba wax emulsion. A dry bright polish can also be made as directed by merely leaving out the shellac solution and adding the water used in it to the wax emulsion. The addition of the shellac seems to make it spread more evenly and, as stated, makes a film that is not quite so slippery. It is necessary to use a good grade of light colored carnauba wax (known in the trade as "No. 1") and the directions for making the polish must be carried out as described. The temperature should never be above 100°C (212°F) at any time."

The polish is made as follows:

	<u>Trial batch</u>	<u>Large batch</u>
Carnauba wax	72 grams	13.2 lbs.
Oleic acid	9.1 ml*	1.6 pints or 1.5 lb.
Triethanolamine	10.6 ml	1.9 pints or 2.1 lb.
Borax	5.4 grams	1.0 lb.
Water (boiling)	500 ml	11.5 gal.
Shellac (dry flakes)	10.0 grams	2.2 lbs.
Ammonia (28 per cent)	1.75 ml	0.35 pint or 165 ml
Water (room temperature)	100 ml	2.0 gals.

*milliliters (ml)

(1) Melt the wax and add the oleic acid. Temperature should be about 90°C (194°F). Placing the container in boiling water keeps the polish at a good temperature.

(2) Add the triethanolamine slowly, stirring constantly. This should make a clear solution.

(3) Dissolve the borax in about 5 ml of the boiling water and add to (2). Stir for about 5 minutes. This gives a clear, jelly-like mass.

(4) Add the rest of the boiling water, slowly with constant stirring. An opaque solution should be obtained. Cool.

(5) Add the 100 ml of room-temperature water to the shellac and then the ammonia and heat until the shellac is in solution. Cool.

(6) Add the shellac solution to the wax solution and stir well. The resulting solution should give a clear film when applied to linoleum, mastic floors, etc., and one that is not too slippery.

V. CEMENT (CONCRETE) FLOORS.

Unpainted cement floors may be scrubbed with hot water and a scouring powder, or with hot water and washing soda (laundry soda or "modified soda"), sodium metasilicate or trisodium phosphate followed by scouring powder. The floor should first be wetted with clear water and then with the hot solution of washing soda (about 2 to 2 1/2 oz. per gallon of water), sodium metasilicate or trisodium phosphate (about 1/2 oz. per gallon of water), sprinkled uniformly with the scouring powder, rubbed or mopped, and then rinsed thoroughly with clear water to remove alkaline salts and scouring powder. The use of soap on unpainted or untreated cement floors is not recommended as a scum of lime soap may be formed on or in the surface of the floor. Painted cement floors should be washed or mopped with plain water. If very dirty, a slightly soapy water might be used, followed by thorough rinsing with clear water, but such treatment should not be used as a general or frequent procedure.

Occasionally cement or concrete floors are waxed. The waxes commonly used on wood floors can be used on painted or unpainted cement floors. As these waxes generally vary in color from yellow to brown, they should be used sparingly, as any wax or oil that may penetrate into the floor will tend to darken it. Waxes have been applied in a molten condition to unpainted or untreated cement floors as a special floor treatment (see Letter Circular No. 139 referred to below), but this treatment is not in general use. Recently water-wax emulsions (such as a mixture of carnauba wax and resins dispersed in water) have been put on the market for polishing cement floors and preventing the "dusting" of such

floors. Wax treatments also make the floors water-repellant. Concrete or cement surfaces with deposits of oil or grease, such as driveways and the floors of garages, shops and engine rooms, may be cleaned with sodium metasilicate powder (about 4 oz. per gallon of water), trisodium phosphate (about 4 oz. per gallon of water), or a mixture of 60 per cent trisodium phosphate and 40 per cent soda ash (about 1/2 to 1 lb. of the mixture per gallon of water). An abrasive powder (scouring powder) may be mixed with the above solutions. These detergents should be used with very hot water and the surface might be rubbed with a wire brush, or an abrasive powder and a mop. If the deposits are thick and of long standing, the powdered detergents may be sprinkled over them and moistened with a little water; after standing about 1/2 hour the surface should then be scrubbed, using very hot water. After scrubbing, the surfaces should in all cases be thoroughly rinsed with plain water. Instead of the foregoing treatment, the oil and grease can be mopped off with kerosene and the mopped areas covered with a layer of sawdust for a few days. After sweeping off the sawdust, the surfaces can be further cleaned with the above detergent solutions if necessary. The following procedure has been found effective in removing old oil stains: first scrub the surface with a hot solution of trisodium phosphate (about 3 to 4 ounces per gallon of water), using an abrasive powder with the solution if there is a dark colored film on the surface. Then mix whitening with some of the hot trisodium phosphate solution to form a thick paste; cover the stained area with the paste and leave until dry; scrape off the dried paste and rinse the surface with clear, hot water. Repeat this poultice treatment if necessary. In the case of badly soiled concrete or cement floors the appearance may also be improved by sprinkling over the scrubbed floor a layer (about 1/4 inch thick) of dry hydrated lime, allowing to stand for several hours, and then removing the covering layer. In some cases it may be desirable to repeat the washing and the dry hydrated-lime treatment several times. Fine, dry coal ashes may be used instead of the hydrated lime. Solvents, such as carbon tetrachloride or a mixture of carbon tetrachloride (2/3) and gasoline (1/3) could be effectively used on the washed and dried floor in conjunction with the hydrated lime or ashes, but this would be quite expensive.

Some years ago the Bureau made tests of various treatments to prevent excessive wear and dusting of concrete floors and for holding the dust produced by wear or abrasion on such floors. These tests are described in Letter Circular No. 139 on "Report of Service Tests on Concrete Floor Treatments". A copy of this letter circular may be obtained free of charge upon request to the Bureau of Standards.

VI. VITREOUS TILE OR CERAMIC AND TERRAZZO FLOORS

It is good practice to clean these floorings periodically with a vacuum cleaner. The routine washing of these floors is usually carried out by first wetting them with clear water and then mopping with hot water containing a small quantity of an alkaline cleaner, such as washing soda (about 2 oz. per gallon of water), trisodium phosphate, or sodium metasilicate (about 1/2 oz. per gallon of water). Badly soiled areas on the floor may be cleaned with a scouring powder or a little scouring powder may be sprinkled over the soiled areas before applying the alkaline cleaning solution. Occasionally, the entire floor should be scrubbed with a scouring powder or with an alkaline cleaner and the scouring powder. A motor-driven scrubbing machine is a desirable appliance. After cleaning, the floors should be thoroughly rinsed with plain water and wiped dry. If water is left standing on a tile floor it might loosen the cement that holds the tiles in place. Soaps are not generally used on these floors owing to the tendency to "build up" slippery films, especially if the water is not soft or the rinsing has not been thorough. However, such floors are sometimes wiped up with a cloth wrung out of hot, soapy water, rinsed off, and wiped dry. If soft water is used and the surfaces are thoroughly rinsed after cleaning, it is believed that soap would be satisfactory, but more expensive, for the routine cleaning of these floors.

VII. MARBLE AND TRAVERTINE FLOORS

Travertine floors should be first cleaned with a vacuum cleaner and then treated the same as terrazzo floors. It is good practice to clean marble floors periodically with a vacuum cleaner. In cooperation with the National Association of Marble Dealers, the Bureau of Standards has made a study of the maintenance of interior marble. A report of this work was published in 1927 as Bureau of Standards Technologic Paper No. 350, entitled "A Study of Problems Relating to the Maintenance of Interior Marble". This paper is now out of print, but it can be consulted in many libraries. The following conclusions are reported in the paper: (References to polished marble do not apply to floor tiles).

"1. Various cleaning preparations have been studied with a view of determining the effects on marble of certain ingredients from a long period of use. The laboratory experiments, as well as an examination of actual installations of marble, have indicated that injury may result from injudicious use of harsh grits or from such salts as sodium carbonate, sodium bicarbonate, and trisodium phosphate.

"2. The usual type of grit employed in trade cleaning preparations is not appreciably injurious to marble floors or other unpolished marble. Polished marble should rarely be cleaned with preparations containing a scouring agent or abrasive which is harder than the marble.

"3. As a rule, the volcanic ash grits are less severe in their abrading action than crushed quartz. This is evidently due to the difference in shape of the particles.

"4. While it is seldom if ever necessary to use a cleaning preparation of the scouring type on polished marble, when it is in stock for cleaning the floors of a building it is apt to be wrongly used on the polished marblwork. For this reason a preparation of the type is desirable which has a grit that will not injure polished marble. Available minerals which seem to meet this requirement are soapstone and talc.

"5. A trial preparation consisting of 90 per cent powdered soapstone and 10 per cent soap powder appeared to be as effective in cleaning marble floors as any of the present trade preparations. Such a composition can be used on polished marble without appreciable injury.

"6. Injury which may result from the frequent use of such detergents as sodium carbonate, sodium bicarbonate, or trisodium phosphate is mainly a physical effect due to these salts crystallizing in the pores. This action has been demonstrated to be severe enough to cause disintegration of marble when such salts are employed without proper precautions.

"7. Experiments have indicated that marble work may be safely cleaned with such detergents if the surface is rinsed with clear water before applying the cleaning solution.

"8. Although soap has been found objectionable for use on marble in certain instances, the present study has indicated that if used with soft water it will give entirely satisfactory results and prove to be the safest detergent for general service.

"9. Preparations containing a coloring ingredient of different color than the marble may gradually impart their color to the marble. This, however, may be prevented by a preliminary rinsing, as described in conclusion 7.

"10. Ammonia water has been used to some extent in cleaning polished marble, but a limited number of tests in this investigation have indicated that it may cause yellow discolorations.

"11. Acids dissolve marble, and even the use of such weak acids as oxalic will prove injurious. Although cleaning of interior marble with acids has been practiced to some extent, it is usually done through ignorance of the real effects.

"12. Stains which have penetrated the marble usually have to be removed by means of a poultice treatment. Several types of stain demand special treatment, and there is no single cure for all cases. Methods have been found for eradicating practically all of the common stains occurring on interior marble."

An abstract of Technologic Paper No. 350 has been published as a booklet, "Maintenance of Interior Marble", by the National Association of Marble Dealers, 721 Rockefeller Building, Cleveland, Ohio.

VIII. LINOLEUM FLOORINGS

Untreated floorings should be swept daily with a soft floor brush or an oil-treated mop. Anything spilled on the flooring should be wiped up as soon as possible with a damp cloth; and occasionally, as the flooring needs it, it should be washed. Care should be exercised in washing these surfaces. Preparations containing free alkali, alkaline salts, or abrasives should not be used. The safest procedure is to use a lukewarm solution (soft water) of a mild or neutral soap and to rinse all soapy water off with plain soft water after washing. The surfaces should be finally wiped dry with mops or cloths. Care should be taken not to flood the surfaces with water, since any water that seeps through the edges or seams may affect the cementing material and may cause the burlap backing to mildew or rot. Linoleum in kitchens, pantries, or entries will look brighter and wear better if the clean, dry, unwaxed surface is given an occasional coat of a pale, quick-drying lacquer ("Linoleum Lacquer"). Never lacquer over wax. The lacquered surface after drying may be waxed, but this is not generally done. The lacquered surface may be cleaned daily with a dust mop or, whenever required, with a damp cloth. These floors should be relacquered occasionally, depending upon the severity of wear.

In rooms or places where the wear on the floors is not particularly heavy, the clean, dry linoleum should be waxed and polished. Any good floor wax is suitable for linoleum. A wax prepared according to formula (1) on page 5 is satisfactory. Paste wax can be used but "liquid" wax is easier and more economical to apply. The newer water-wax emulsions (see p. 5) are also used. Care should be taken not to put the wax on too thickly as it is likely to smear and give a greasy appearance to the floor. Too much wax will cause the floor to be slippery. After applying the wax, it should be polished for some time with

a weighted floor brush or an electric polishing machine. Daily care of a well-waxed and polished floor should consist in going over it with a dry dust-mop. Washing is seldom necessary - perhaps two or three times a year. Waxing not only adds to the appearance of the linoleum, but provides a wearing surface and protects the floor. An occasional polishing may be necessary on the main traveled areas. Rewaxing will be required from time to time depending upon the amount of traffic. Depending upon the service conditions, the floor may require scrubbing at times, after which a coat of new wax should be applied. "Linoleum tile" floors, and linoleum floors subjected to much wear, should be given one or two coats of a linoleum lacquer and then waxed and polished. After the wax has dried for a short time on the "tile" floors, run a polishing machine equipped with a fine-bristled brush over the floor in both directions in order to work the wax into the surface. Sweep off any dust or wax particles and polish with an electric polishing machine. Lacquered and waxed floors should be cared for as outlined for surfaces that have been waxed directly. Before lacquering an old linoleum or "linoleum tile" floor, it must be thoroughly cleaned with a cloth dampened with gasoline and frequently squeezed out in fresh gasoline during the cleaning, in order to remove all grease and wax. Then the entire floor should be scrubbed with lukewarm soapy water, rinsed thoroughly with plain water, and allowed to dry.

The life of a linoleum floor covering can be prolonged by applying a pale, transparent varnish but this treatment is not recommended, as many varnish coatings become slightly yellow. This mars the design effect in patterns and may produce a decided discoloration over plain surfaces. Some varnishes will turn white when water is spilled on them. The same objections may apply to shellac. Floor oils and sweeping compounds containing oil should not be used on linoleum, as these materials may leave a film of oil on the surface to collect dust and dirt. Varnished surfaces can be waxed to produce a "dull polish".

IX. RUBBER FLOORS

To clean unpolished floors, brush off loose dirt with a soft push-broom and wash a small section of the floor with a clean mop wrung out of a solution of washing soda ("modified soda" or laundry soda) or trisodium phosphate (about a quarter of a cupful of the cleaner dissolved in 12 to 16 quarts of clear, cold water). Cleaning may also be done by mopping with clear, cold water containing 2 to 4 ounces of ordinary household ammonia per gallon. Rinse the mop in a second pail of clear, cold water, wring the mop, and wipe the section of floor clean of solution. Continue this process until the entire floor is cleaned. After the floor

has dried, buff it thoroughly with a rotary electric buffing machine (for large areas) or a weighted hand buffer to which a piece of rough carpet or similar material is attached as a buffing surface. Daily cleaning can often be satisfactorily done by sweeping with a soft, dry brush, or with a soft push-broom, and an occasional washing with a clean mop wrung out of clear, cold water. When very dirty, the floors should be cleaned with a washing solution as outlined above. Frequent systematic buffing of unpolished floors materially reduces the number of washings required. Owing to the development of the bright-drying wax-water emulsions (polishes) free from oils, fats and organic solvents, it is now general practice to polish rubber floors. The wax or polish enhances the appearance of the floors and prolongs their life. After cleaning, drying, and buffing as outlined above, the floor is ready to polish if all dirt and marks have been removed. Pour the polish into a shallow receptacle, dip the applicator* into the polish and apply

*

Made of lamb's wool, soft absorbent cloth, or felt. The felt applicator, made of 4 or 5 strips of 1/2-inch thick felt stood on edge and bound together, is very satisfactory. Applicators are generally furnished by polish manufacturers.

a thin coat over a small area with a wiping motion. Do not rub hard. Repeat until the entire floor is covered. Let dry until hard (about 30 minutes) and then buff. Immediately apply a second thin coat, let dry, and again buff thoroughly. The polish should be applied in as thin coats as possible to avoid streaking and at least two coats should be applied. If the polish wears off in certain sections of the floor, clean and repolish only these sections rather than the entire floor. Systematic buffing keeps the polished floor in good condition and reduces the number of washings required. When the polished floor becomes soiled, remove the loose dirt with a soft brush or a soft push-broom and wipe the floor with a clean mop dampened with clear, cold water. This treatment should not remove the polish. If this procedure does not clean the floor, it should be treated as outlined above, using a washing solution. When necessary, the wax or polish can be removed from rubber floors with a solution of trisodium phosphate in warm water (about 2 ounces per gallon) with the aid of 00 steel wool. The addition of a small quantity of household ammonia to the solution will hasten the removal of the wax (and dirt).

Stains may be removed from rubber floors by rubbing the stained area with a fine abrasive powder or with number 00 steel wool. If this is ineffective, the spot may be rubbed carefully

with a clean cloth dampened with acetone (flammable), gasoline (flammable), or carbon tetrachloride (non-flammable). Gasoline, acetone, and carbon tetrachloride have a softening action on rubber if in contact with it long, but the softening is not permanent.

Cleaning materials containing oil (certain sweeping compounds and other detergents) and coarse abrasives, or caustic alkali should not be used on rubber floors. Soap may soften and swell rubber flooring. Although this effect is minimized with careful rinsing, the safest procedure is to avoid the use of any soap. Waxes or polishes containing oils, fats, or organic solvents should not be used. Do not use hot water or excessive amounts of water when cleaning rubber floors. The floor should not be flooded with water. Avoid using more of the cleaning compound than specified and thoroughly mop or rinse the surface in order to remove all of the cleaning solution. Rubber floors should not be varnished. Buffing machines should not be used for scrubbing with water and cleaning agents. The advice or recommendation of the manufacturer of the rubber flooring should be secured before using unknown cleaning preparations or applying untried methods.

X. CORK TILE AND CORK CARPET FLOORINGS

Many cork floorings are installed without any surface treatment other than sanding to a smooth surface. These floorings are commonly referred to as "natural" cork and often may be cleaned by dry sweeping with a hair floor brush. The entire surface is then buffed or polished with suitable pads, a polishing machine or a floor-polishing brush. Care should be taken to overlap the polished sections. If the floor can not be cleaned in this manner, it should be swept with a soft brush and then mopped with a lukewarm soapy solution made with a mild or neutral soap and clean, soft water. A separate container of clean, lukewarm, soft water and a separate mop should be used for rinsing. The rinse water should be changed frequently, so that both rinsing water and mop are always clean. Only a small area (say about 50 sq.ft.) of flooring should be washed at one time and it should be thoroughly rinsed with clean water and wiped dry. Water should not be left on the floor.

Where cork flooring is subjected to much heavy and dirty traffic, it should be varnished with a pale, transparent spar varnish, and then waxed and polished. With cork tile it is good practice to apply a filler before varnishing. The varnish usually requires overnight to dry. A dull or mat finish may be secured in place of the glossy varnish by scrubbing the varnished floor with a neutral soap and water and rottenstone or finely

powdered pumice. These treatments form protective coatings, but the treated floors require careful and frequent attention. The floors should be washed clean and allowed to dry thoroughly before applying filler, varnish or wax. The waxes used for linoleum may be used on cork floors. Liquid floor wax is generally used and is applied in a thin, even coat and rubbed in. When the wax is nearly dry (tacky), apply a second coat of wax in the same manner. When the second coat becomes tacky, polish thoroughly with a polishing machine, a weighted brush, or a clean soft cloth. The appearance of the surface improves with frequent polishing. The newer water-wax emulsions that dry rapidly and require little or no polishing are also widely used for waxing cork floors (see p. 5).

Waxed cork floors are cleaned by rubbing with a dry mop or polishing brush, followed by sweeping with a brush or a vacuum cleaner.

A polishing machine is a useful appliance for large areas. Cork floors should be polished or buffed with a brush or machine whenever they appear dull or dingy. The floors should be re-waxed from time to time, depending on traffic conditions and exposure to dirt. The floors should be re-waxed before the old wax is worn off. Areas (doorways, traffic lanes, etc.) subjected to the most wear may be re-waxed when necessary without going over the entire floor. Before re-waxing the floor all wax must be removed by rubbing the surface with a cloth dampened with gasoline (flammable), followed by vigorous scrubbing with warm water and soap, rinsing with clean water and drying. If this does not remove the wax, the dried surface should be resanded.

Lacquer suitable for linoleum may be used on cork floors in lieu of waxing. The surface should be thoroughly cleaned and dried before applying the lacquer. Two or three coats of lacquer are used for the first treatment in order to fill the pores of the flooring and give a smooth, dirt-resistant surface. Further coats may be applied as the appearance requires. "Natural" cork floors which have been varnished may be kept clean by sweeping with a dust-mop, soft brush, or a damp cloth or mop.

Stains and spots may be removed from cork floors by rubbing with fine emery paper or number 00 steel wool. In some cases the spot or stain may be rubbed with a cloth dampened with acetone (flammable) or with carbon tetrachloride. The cleaned areas should then be buffed and waxed, or varnished and then waxed.

XXI. ASPHALT TILE AND MASTIC FLOORS

These "soft composition" floors are sold under various trade names and, in general, have a base of asphalt, bitumen or resin. Cleaners and polishes containing abrasives, oils or organic solvents (gasoline, turpentine, carbon tetrachloride, etc.) should not be used. These floors should be washed by mopping with a neutral soap and lukewarm soft water. Scrubbing machines with soft polishing brushes have been used for large areas. After cleaning and drying, these floorings (especially the asphalt tile) are generally waxed in order to cover the surface with a protective film. The water-emulsion waxes (see p. 6) free from oils and volatile organic solvents are the safest waxes to use on these floorings. This type of wax can be applied with a cotton cloth mop or wool applicator. The wax should be spread as thinly as possible on the surface of the floor, using the mop or applicator in one direction only. In a short time the wax should dry to a hard, lustrous finish.

Asphalt tile floors should not be buffed or burnished until the wax or other treatment is completely dry. The treated floors may be maintained by sweeping with a brush, a dry mop, or by buffing with mechanical buffers. Scrubbing with water and a neutral soap may be required at times (probably two or three times a year). Oils, soaps or other detergents containing abrasives, and sweeping compounds containing free oil should not be used on the untreated or the treated floors. The floor treatments should be renewed at intervals, depending upon the severity of wear.

Before treating an asphalt tile floor with an unknown preparation, moisten a white cloth with the preparation and rub over the surface of one tile. If the color of the tile shows on the cloth it indicates that the solvent in the preparation has dissolved part of the surface of the tile and shows conclusively that the preparation would not be safe to use. It would be safer to get the advice of the manufacturer of the flooring before using unknown cleaning preparations.

XII. PLASTIC MAGNESIA CEMENT FLOORS

These floors contain magnesium oxychloride as the cementing material and are known by various names ("Sorel cement", "Hard Composition", "Magnesite", "Woodstone", etc.) These floors may be cleaned by first wetting with clear water and then mopping with a neutral soap and warm soft water (a soft soap, such as a linseed oil-potash soap is often used). After cleaning and drying, the floors may be given a protective coating of wax (water-wax

emulsion) or of special varnish or lacquer. The treated floor may be cleaned by sweeping with a dry mop or soft brush, and occasional washing, and buffing with a weighted brush or polishing machine. The waxing or other treatment is renewed as conditions require.

XIII. SLATE TILE FLOORS

These floors may be cleaned by mopping with a neutral soap (aspaste soap is often used) and warm soft water. After cleaning and drying, the floors may be waxed with a water-wax emulsion or given a coat of pale varnish or lacquer. The treated floor can be kept in good condition by sweeping with a dry mop or soft brush, and an occasional buffing with a weighted brushed or polishing machine.

XIV. REFERENCES

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Government Publications

(The publications for which prices are indicated may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C. Remittance should be made by coupons (which may be purchased from the Superintendent of Documents in sets of 20 for \$1.00), postal money order, express order, or New York draft payable to the "Superintendent of Documents, Government Printing Office, Washington, D.C." Currency may be sent at sender's risk. Postage stamps, defaced or smooth coins, or foreign money positively will not be accepted. Publications are forwarded under Government frank to addresses in the United States and its possessions; also to Mexico and Canada. The publications not priced may be obtained directly from the Bureau of Standards.)

Materials for the Household. B.S. Circular C-70. 50¢

Washing, cleaning and polishing materials. B.S. Circular C-383. 10¢

Safety for the household. B.S. Circular C-397. 15¢

Floors and floor coverings. U.S. Department of Agriculture Farmers' Bulletin No. 1219. 5¢

Housecleaning made easier. U. S. Department of Agriculture Farmers' Bulletin No. 1180. 5¢

Acid-proof coatings for concrete surfaces. B.S. Letter Circular LC-42

Report of service tests on concrete floor treatments. B.S. Letter Circular LC-139.

Rubber floor tile. B.S. Letter Circular LC-270.

Polishes. B.S. Letter Circular LC-275

Federal Specifications for Detergents

<u>Spec. Symbol</u>	<u>Material</u>	<u>Price</u>
P-P-591	Powder, Scouring (for) floors	5¢
P-S-561	Soap, automobile	5¢
P-S-566	Soap, chip	5¢
P-S-571	Soap, grit, cake	5¢
P-S-576	Soap, grit, hand	5¢
P-S-586	Soap, laundry, liquid	5¢
P-S-591	Soap, laundry, ordinary	5¢
P-S-596	Soap, laundry, powdered	5¢
P-S-618	Soap, liquid	5¢
P-S-606	Soap, powder	5¢
P-S-611	Soap, salt water	5¢
P-S-616	Soap, toilet, floating, white	5¢
P-S-621	Soap, toilet, milled	5¢
P-S-631	Soda, caustic (lye)	5¢
P-S-641	Soda, laundry (washing soda)	5¢
O-S-571	Soda ash	5¢
O-S-581	Sodium carbonate, granular (monohydrate crystals)	5¢
O-T-671	Trisodium phosphate, technical (phosphate cleaner)	5¢