Modern Laundry – Equipment, Supplies, Methods
Michigan State University Extension Service
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MODERN LAUNDRY

- *Equipment*
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MICHIGAN STATE COLLEGE :: EXTENSION SERVICE

EAST LANSING

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MODERN LAUNDRY EQUIPMENT SUPPLIES, AND METHODS

JULIA POND—HELEN NOYES

The purpose of this bulletin is to give practical and usable information concerning equipment, supplies, and methods to be used in the laundering of clothes.

LAUNDRY ROOM AND EQUIPMENT

ROOM

It is a great convenience to have a laundry room which does not have to be used for other purposes. This room should be large enough to work in conveniently but not so large that it is a burden to clean. There should be cross-ventilation and sufficient light to enable the worker to see to remove stains and soil from clothing.

A floor drain is desirable because it makes the emptying of the washing machine and tubs easier. If possible a source of running water, both hot and cold, should be conveniently located in this room.

WASHING MACHINE

There are many models of machines on the present market which give a wide range of selection. The following points should be considered in the selection of your machine.

Cost—A machine within your price range, made by a reliable company, and sold by a reliable dealer should be a good investment.

Upkeep or Service—The machine should be so constructed that it will require little servicing. It is more satisfactory if the servicing can be done by the dealer from whom the machine is purchased.

Type of Power Available—Three types of machines are available. They are hand, gasoline, and electric. If a hand power machine is chosen, the lever or wheel by which it is operated should be at a convenient height and arranged to carry the load with the least strain on the arm. The machine should run with a smooth, not a jerky motion.

The gasoline power machines are of two types. The machine may be driven by a portable one and one-half horse power engine, either by belt and pulley direct to the washing machine or by a line shaft, or by a one-half horse power engine mounted on the frame of the washing machine.

Fig. 1. Equipment for washing including machine, wringer, two portable tubs, basket and stand. Note the drains on the tubs and the wall outlet for attaching the machine. Running water would add to the efficiency of this arrangement.

The cost of operating the gasoline engine is very small. The portable one and one-half horse power machine can be operated for 10 hours on one and one-half gallons of gasoline.

The one-half horse power stationary engine can be operated on one-half gallon of gasoline for 10 hours, which is the average number of hours needed to do the washing for one month.

The electrically driven washing machine is the simplest to operate of all types. Most of them are equipped with one-quarter horse power motors which will operate on three kilowatt hours of electricity to do 10 hours of washing. This is approximately one month's operation.

As a protection for the worker all moving parts on machines should be enclosed. The motor should be placed in a position to protect it from water, and on electric machines it should be grounded or insulated from the metal framework to prevent all possibility of electric shock to the worker.

Types of Machines—The great majority of the present day washing machines are of the agitator type. This type of machine has a device consisting of blades attached to a vertical shaft which revolves back and forth in the bottom of the tub carrying the clothes with it and agitating the water at the same time.

Two other types of machines found on the market are the vacuum-cup and cylinder. The vacuum-cup machine has one or more inverted cups attached at the top of a centrally located vertical shaft. These cups usually move up and down and in a horizontal position thus forcing the water through the clothes.

In the cylinder type machine the clothes are placed in a perforated cylinder which rocks back and forth in an outer container holding the water.[1]

The type selected depends upon such factors as personal preference, money available, and the selection of machines carried by local dealers. The efficiency of any machine depends partially upon the amount of

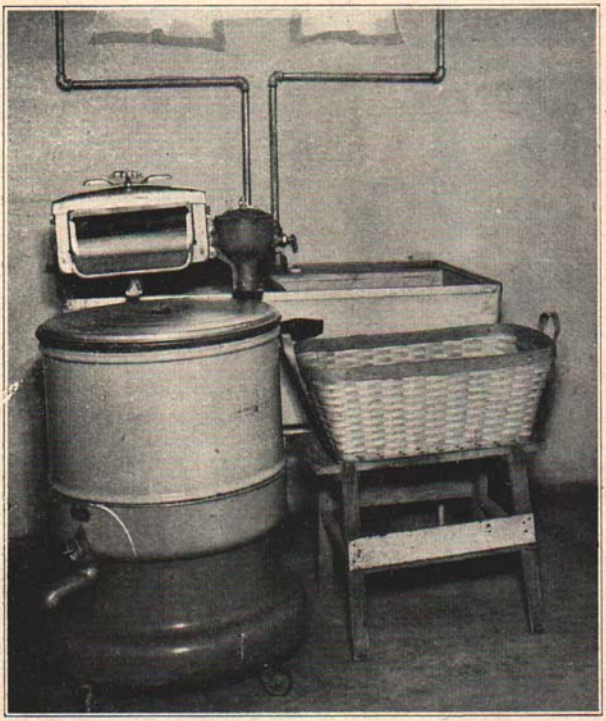

Fig. 2. Convenient arrangement of washing equipment including machine, two stationary tubs, basket and stand. The tubs are equipped with hot and cold water and drains.

[1]Farmer's Bulletin 1497—U. S. Department of Agriculture. "Methods and Equipment for Home Laundering."

water used and the size of load. There is an optimum water line and load for every machine. The operating time of the machine should be decreased when washing sheer fabrics or when the machine is underloaded.

Tank Materials

From the standpoint of the user, it is important for the tank of the machine to be non-corrosive and easily cleaned. The following is a classification of materials commonly used for washer tanks, together with some of the considerations which are of interest.

Porcelain-enameled tanks usually are on the moderate-priced machines. They are made by applying one or more coats of vitreous porcelain enamel to sheet steel. The ground coat is always dark in color. If light colors are required additional coats may be added. Partial coats give a speckled appearance. Enameled tanks are easy to clean but may chip under sudden changes in temperature or rough treatment.

Stainless Metals—Alloys, such as stainless steel, are found on some of the more expensive washers. They are light, strong, durable, and easy to clean.

Nickeled-copper tanks are generally found on washers of moderate cost. This material is strong and durable but requires frequent cleaning.

Aluminum discolors with strong soaps and alkaline water softeners. It is light in weight and durable. The smoother the surface of the aluminum tank the easier it is to clean.

Size of Machine

The size of the machine selected depends entirely upon the number in family, which determines the size of the washing. For a family of five, a seven- or nine-pound capacity machine would be best. A sheet for a double bed represents approximately one pound.

Type of Wringer or Extractor

The washing machine may be equipped with either a wringer or extractor.

Soft or semi-soft wringer rolls have a larger area of contact than hard rubber rolls. Soft rolls cause less injury to the clothing, buttons are not removed because soft rubber adapts itself to irregularities in the fabric, creasing is less evident and ironing is made easier. However clothing seems to cling more readily to the softer rubber. The semi-soft rolls have the good qualities of both soft and hard rubber. They stand up under strain of use, and conform to the variations in thickness of material being wrung.

A wringer should lock in at least four positions for greatest convenience in wringing clothes from tubs. Ball bearings, heavy springs, enclosed gears, and reversible action are other desirable features on any wringer. On power machines a safety release device is a necessity in case fingers or clothing should be caught in the wringer rolls. The release should be easy to operate, very accessible, and separate the rolls completely.

The extractor has several advantages over the wringer: Several pieces can be dried at one time, no creases are pressed into articles, buttons are not pulled off, and there is no danger of catching fingers. There are also certain limitations to the extractor. Unless the extractor is in the tub greater floor space is required for the machine than if it were equipped with a wringer. If the extractor is in the tub only one process can take place at a time, thus lengthening the period required to do the laundry. The clothing must be entirely lifted from the tub of the machine into the basket of the extractor. If the material is heavy and bulky, this is more difficult than using a wringer which helps in lifting the material. Clothes must be packed evenly into the basket of the extractor or considerable vibration occurs.

Some of the special convenience features desired are simple construction to make the machine easier to clean, grease, or oil, rounded corners on inside of tub, easy moving castors, adjustable legs, and faucet or pump for water outlet.

ADDITIONAL EQUIPMENT

Tubs—Stationary laundry tubs are preferable but sometimes the cost is prohibitive. Portable tubs are usually made of galvanized iron and are satisfactory because they are light, easily cleaned, durable, and inexpensive. Hot and cold water can be piped to them or they may be filled by using a rubber hose. A hose can also be used to siphon water from a tub if it is not provided with a drain. A suitable stand of the correct height equipped with castors should be used to save stooping and lifting.

Table—A table for sorting, covered with some washable material, will make this part of laundering much easier. If desired this table may be equipped with bins for storing sorted clothes or with shelves and drawers for small supplies and laundry equipment.

Other Equipment—Other pieces of equipment necessary for the home laundry are clothes line (a good grade of rope or galvanized wire preferred), clothes basket, wash board, clothes pins, clothes pin bag, and funnel or suction washer for use in hand laundering. The clothes pin bag can be made to fit a dress hanger which makes it possible to hang the bag on the line and push it along as needed. The clothes basket is much easier reached if, while hanging out the clothes, it is placed on the children's wagon and moved as necessary.

LAUNDRY SUPPLIES

WATER SOFTENERS

If the water is not soft, some type of softener should be used because soap in hard water forms curds which are deposited in the fibers of clothing and cause grayness. Hard water may take twice or three times as much soap as slightly hard water.[2] Soap will soften water if enough is used but it is much more expensive for this purpose than a water softener. Trisodium phosphate and washing soda are the best

[2]Roberts, Evelyn H.—"The Efficiency of the Home Laundry Plant"—Washington State College Bulletin 248.

and the least expensive softeners. Lye and ammonia are not so desirable. Borax, though expensive, is especially adapted to the washing of wools and silks. The amount of softener necessary depends upon the degree of hardness of the water. The following information can be used as a guide for softening water.[2]

Very soft water—Use no softening agent.

Fairly soft water—Use 1 or 2 level tablespoonfuls of sal soda to each 10 gallons of water or one level tablespoonful of trisodium phosphate.

Moderately hard water—Use 3 or 4 level tablespoonfuls of sal soda to each 10 gallons of water or 1 or 2 tablespoonfuls of trisodium phosphate.

Very hard water—Use 5 to 7 level tablespoonfuls of sal soda to each 10 gallons of water or 3 to 4 tablespoonfuls of trisodium phosphate.

Test the hardness of water by first filling washing machine or tub with hot water and measure in a small amount of softener, not more than one-half teaspoonful for each gallon of water. Wait until water softener reacts, about 5 minutes for one of the mild softeners and 10 minutes for washing soda. When curds are formed, dip out a pint of water and add 1 to 2 teaspoonfuls of soap. If soap makes suds the water is soft. If not, measure a little more softener into the machine and give it time to react. Dip out another pint of water and repeat the soap test. Repeat these tests until a scum is obtained and a sample of water makes a good suds with 1–2 teaspoonfuls of soap. Write down the amount of softener used and keep for a guide on future wash days.[3] Soap should not be added to the water until the softener has had time to react.

SOAPS

In selecting a soap, the following points should be considered:

1. Type of fiber to be laundered. Silks, rayons, and woolens require a mild or neutral soap, while cottons and linens can stand a somewhat stronger soap.
2. Cost. Avoid any soap in any class that is distinctly above or below the average in price per pound. Flakes and powdered soaps have a lower water content and therefore should be more economical than some of the bar soaps.

Builders and Fillers

Avoid all laundry soaps that have a high percentage of filler (useless weight or bulk making material) and builders (cheap water softeners). When a water softener is needed save money by using an inexpensive softener, such as trisodium phosphate or sal soda and a good grade of soap.

Rosin is commonly used in many laundry soaps. It is a cheap material which saponifies readily to give a yellow soap, and has excellent cleansing properties. It should not, however, be present in amounts greater than one-third of the total fat used in the manufacture of the soap, as it is irritating to the skin and tends to be deposited on the

[2]See footnote 2, page 7.
[3]Hamilton, Faye I., Jeffryes, Helen—"All About Laundering."

fiber of the clothes, producing yellow stains. Rosin soap is unsuitable for washing textiles which must be boiled because at the boiling point it combines with the lime in hard water to form insoluble yellow stains.

Classes of Soap

Pure Flake, Bead and Bar Soaps—Neutral soaps used in laundering fine fabrics may be purchased in flake, bead or bar form. Such soaps will not harm the hands and may be used for dish washing.

"Soapless" Soaps—A new type of "soapless" soap, different in composition from true soap, is particularly useful in hard water as it does not form curds. It is made in the form of grains and is used on lightly soiled fine garments, as its cleansing power is not so great as that of true soaps.

Chip and Bead Soaps Containing Builders—These are recommended for dish washing, general household, and laundry purposes. They should not be used for colored garments that fade easily, silks, wools, and rayons, unless the garments are badly soiled and hard water has to be used.

Ordinary Bar Laundry Soap Containing Builders—These are suitable for white cottons and linens. The milder bar soaps can be used for more delicate fabrics and colored clothes.

Soap Powders—Soap powders are used for rough general housework and for laundering badly soiled, coarse garments, such as overalls. The 40 percent soda ash content makes these powders hard on the skin, clothing fibers, and color.

BLUING

If the correct method of washing is followed, it is not necessary to use bluing to keep clothes white. Bluing is not a bleach. The blue dye covers the yellowness in the clothes, therefore giving the appearance of whiteness.

There are three types of bluing: ultramarine blue, which comes in ball or cube; Prussian blue which comes in bottle or liquid form; and aniline, a liquid bluing used in commercial laundries. Two types of household bluing, ultramarine and Prussian, have certain disadvantages. If the soap has not been thoroughly rinsed from the clothes before using Prussian bluing, there is danger of rust spots appearing because the alkali in the soap combines with the iron salts in the bluing to form rust. This will also occur if the water used for washing is extremely alkaline. This yellowness cannot be removed except by dissolving it with oxalic acid. Bluing may be tested for iron by adding concentrated ammonia or sal soda to a little bluing. Heat mixture. A reddish brown color indicates Prussian blue.[4] Ultramarine blue is not soluble in water and clothes are likely to be streaked if the bluing process is not done quickly. There is also danger of using too much bluing. Soap flakes containing bluing may be used in the first suds or suds rinse. These are recommended for hard water because there is less danger of rust spots forming. The liquid aniline blue is the most

[4]See footnote 1, page 5.

effective and the cheapest to use if it seems necessary to use any bluing to keep the clothes white.

STARCH

Starch is used to give body to the material to replace the original finish which is removed by laundering, except in the case of permanent finish materials. Starch can be made more pliable and glossy by adding one-half teaspoonful of borax to the starch mixture. It is less likely to adhere to the iron if one-half teaspoonful of paraffin is added and if starch is thoroughly cooked.

Proportions for a good starch are: one-fourth cupful starch, one-fourth cupful cold water, and five cupfuls of boiling water. Mix cold water and starch, then slowly add the boiling water. Boil until clear. Dilute with water to desired thickness. A hot starch mixture penetrates fabrics more uniformly than a cold one.[5]

BLEACHES

Bleaches should be used only when discolored or dingy clothes cannot be made white by other methods. Only white cotton and linen fabrics should be bleached. Sun or dew bleaching is the least harmful and the least expensive. The bleaching should be done on a clean wet fiber. Ammonia and borax are the mild chemical bleaches, while Javelle water and commercial preparations are used when a stronger bleaching agent is required.

To bleach a dingy garment, use 1 tablespoonful of Javelle water to 1 gallon of cool or lukewarm water. Immerse the garment and allow it to remain until the desired amount of bleaching has been accomplished. Longer than half an hour is likely to be harmful to fabrics. Do not boil garments in a bleaching solution. All bleaching processes should be followed by thorough rinsing to remove all of the chemicals which, if left, will weaken the fabric.

LAUNDERING METHODS

COTTONS AND LINENS

Mend all torn places except holes in feet of soiled hosiery. Laundering before mending often increases the size of the worn places and makes a good job of mending impossible.

Remove Stains—Stains, otherwise removable, are made permanent if laundered before an attempt is made to remove them. Consult the stain removal table on pages 18-19 of this bulletin or Farmer's Bulletin 1474, "Stain Removal from Fabrics" for detailed information on this subject.

Sort Clothes according to:

FIBER—Cotton and linen may be put together and woolens, silks, and rayons together.

COLOR—Colored fabrics may be put with white fabrics if one is

[5]See footnote 3, page 8.

certain the colors are fast. Colors which will run must always be kept by themselves.

SOIL—Put garments together according to type and amount of soil found on them.

Body proteins or perspiration stains and protein food stains should always be soaked for a short time in cool water before putting them into the hot suds. Protein soil is set by hot water, causing a yellow stain.

Body and food fats, grease and some machine oils require hot soapy water to remove them. When garments have both protein and fat soil, remove the protein first. Heavy machine oil or grease stains should be removed by applying carbon tetrachloride or a clear fat, such as lard, before laundering.

Starch soil is best removed by a lukewarm suds.

Slightly soiled clothes should never be placed with very badly soiled. The usual grouping is:

Table linens and other slightly soiled household linens.
Bed linens and slightly soiled hand and bath towels.
Body clothes, such as white shirts and slightly soiled underwear.
Tea, hand and bath towels.
Colored cottons.
Very soiled clothes.

Soak Clothes—White clothes and those of fast color may be soaked in lukewarm softened water for 10 to 15 minutes to loosen soil. There is nothing gained by a longer soaking and for that reason the shorter period is suggested. Silk and synthetic fibers should never be soaked. Very soiled clothes may be soaked in warm soapy water. Temperature of water is important and hot water should never be used for soaking.

Soaking is recommended because it loosens the dirt, lessens the wear of the laundering process on the fabric, saves time for the housewife, and decreases the amount of water needed in the machine. Wring or squeeze out as much of the water as is possible before putting clothes into first suds.

First Suds—If clothes have been soaked, hot water 140°-160° F., may be used for this suds. A standing two-inch suds should be maintained. Operate the machine 5 to 20 minutes depending upon the efficiency of the machine and the amount of soil in the clothes. There is danger of running so long that clothes become grimy because of dirt being ground back into them. Soap and hot water may be added to keep a good hot suds. If the washing is large it may be necessary to change the suds.

Suds Rinse removes the dirty first suds and makes clothes easier to rinse in clear water. Temperature should be 115°-120° F. If you use hard water, this is one method of preventing grayness.

Boil only those clothes which need to be sterilized, such as handkerchiefs. If clothes are dried inside, occasional boiling helps to keep them white. Five to ten minutes is ample time for this process.

Clear Rinse—Use lukewarm softened water, 100°-110° F., which is hot enough to remove all soap from clothes.

If one has an ample supply of water a second rinse of 70°-80° F. is desirable. In every case enough clear rinses should be used to remove all soap. Bluing, if used, should be added to the last rinse. The last rinse should not contain water softener.

Starch mixture should be quite hot, free from lumps, and of the proper consistency for the pieces to be starched. Starch should be thick enough to give the effect of the original finish of the material.

Drying—Avoid letting garments become twisted as they come from the final rinse. For convenience in hanging group similar articles together in the basket.

Pieces should be hung squarely on the line and far enough over the line to avoid the dog-eared effect. Men's shirts should be hung by the tails, not by the yokes. Dresses, unless too sheer, should be hung by the hems.

Much time and unnecessary pressing and ironing can be saved if the articles are folded when taken off the line and not pushed into the basket in a haphazard fashion.

Sprinkling—Warm water is best for sprinkling the clothes. Avoid unnecessary wrinkles when folding and let stand long enough for moisture to be evenly distributed. Clothes may stand overnight unless there is danger of mildew.

IRONING

All starched pieces must be ironed. Each woman can decide for herself whether she irons the towels, sheets, and similar articles. If she prefers to save both time and energy for other household tasks or for leisure time by not ironing some articles, she undoubtedly has made a wise decision. The following equipment makes ironing easier; a well-padded portable board with legs of the correct height, smaller boards or molds for special pieces, a light or medium weight iron and a stool to sit on while ironing. Adjust the height of the board so there will be the least amount of strain and stooping on the part of the one doing the ironing.

Three types of irons are used at the present time — sad, gasoline, and electric. The sad iron requires waxing to maintain a smooth surface and occasional oiling to prevent rusting. The gasoline iron can be operated for two or three cents an hour. It takes less time and energy than when sad irons are used.

The electric iron is the most efficient. An iron of 800 or 1,000 watts heats rapidly and is efficient for speedy ironing. Less human energy is required to iron with a 3½- or 4-pound iron than with a 6-pound iron. A thermostatic heat control keeps the iron at an even temperature and utilizes the electricity efficiently. Other convenience features are tapering sides, a bevelled edge or groove to iron around buttons, a large sole plate, heat resistant handle that fits the hand, and a cotton-covered cord with a plug that is easy to grasp.

Ironers save 10 to 20 percent of the time spent in ironing with a flat iron.[6] Tests indicate that the cost of operation is about twice that

of a flat iron.[6] Points to be considered in the selection of an ironer are the type of ironer, size of the shoe, controls, safety devices, and the mounting. The two types of ironers are the rotary and the presser type. Tests indicate that 50 percent more human energy is needed to operate a hand iron than an ironer.[6]

On a rotary type ironer, both a hand and a knee control are convenient. A lever at the back of the roll that releases it from the shoe without the use of electric current will prevent scorching in case of

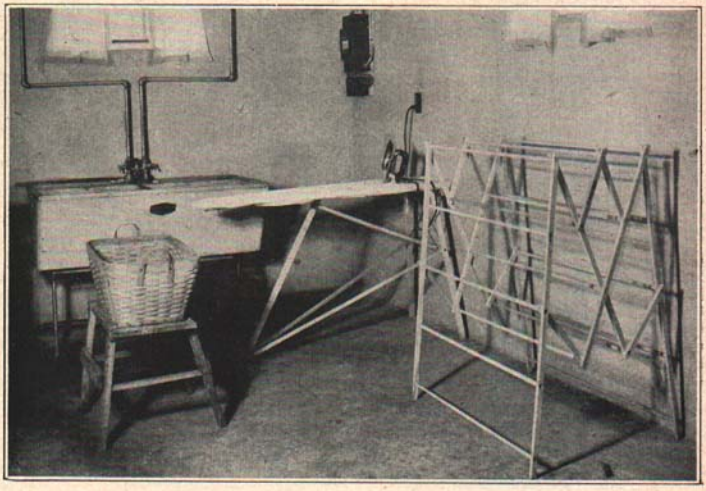

Fig. 3. The washing center of Fig. 2 converted into an ironing center. Note the following: portable ironing board with removable cover, outlet for iron cord, standard for basket, clothes bars. The high windows provide good light and ventilation.

emergency. A temperature control device uses electricity efficiently and prevents scorching. The roll and the shoe should be adjusted so that there is no danger of burns to the hands of the operator. The frame should be sturdy and a cover for the roll is desirable when the ironer is not in use.

Rotary ironers may have a roll that opens at one end. If so, it should be no longer than 26 to 30 inches to prevent sagging. The heat is usually concentrated at the open end as small garments are ironed there.

The heat in the ironer closed at both ends should be evenly distributed. Because there is no danger of sagging, the roll may be longer than in the open end type and wide sheets and tablecloths can be ironed with one fold.

The homemaker will need to develop skill in the use of the ironer to

[6]See footnote 2, page 7.

iron shirts, dresses and similar articles to realize the greatest possible saving in time and energy.

LAUNDERING FINE FABRICS

COLORED COTTONS AND LINENS

Use general laundry methods with following exceptions:

Do not soak unless colors are known to be fast.

There are no effective methods of setting colors. Those ordinarily used are useless.

Handle as rapidly as possible.

Use no strong washing powders or soaps.

Dry in shade and be certain that garments are wrong side out.

WOOLENS

Measure knitted garments, and any others likely to shrink, before laundering. They can be stretched to original size and shape.

Soak only a short time, if at all.

Use abundance of lukewarm water, 90°-100°F., and avoid any change in temperature.

Use a mild soap and no strong washing powders. Make suds rather than rubbing soap directly on to garment.

Squeeze and work in suds without rubbing. A kneading motion is effective and not nearly so hard on garments as rubbing.

Never boil.

Squeeze from suds and rinse thoroughly in several changes of clear lukewarm water the same temperature as soap solution.

Squeeze out by hand or wring carefully through a loosely set wringer. Avoid stretching garment.

Dry in warm place, but not near a fire or in direct sunlight. Never allow woolens to freeze.

Sweaters and knitted pieces should be stretched to original size and allowed to dry flat on several thicknesses of material.

Iron woolen articles on wrong side or use a pressing cloth. The iron should never come in direct contact with right side of article because a shiny surface is produced.

SILKS AND RAYONS

Use general method, with following exceptions:

Make certain color and texture are washable by testing a sample of the material.

Wash in lukewarm suds, rinse, dry and compare with unwashed fabric. Use an inconspicuous part of garment such as end of a belt.

Use only a pure alkali-free soap in flake or bead form. Make a rich suds. The temperature of the water should be 95°-100° F. Wash quickly. Never soak.

Avoid friction. Do not rub or twist. Squeeze the suds repeatedly through the soiled parts. Use second suds for fabrics shedding dye or for quite soiled garments.

Use a suds rinse and two or more clear rinses of same temperature as suds.

Dry quickly in the shade or roll in a towel to absorb the moisture. Garments with colors that bleed can be shaken until almost dry. When nearly dry, shape and press on the wrong side with a moderate iron. Sprinkling may spot some silks.

Never shake knitted silks and rayons. Ease them to correct size. Drying them flat will prevent stretching.

STAIN REMOVAL

GENERAL METHODS

Materials used for stain removal may be classified as absorbents, solvents or bleaches. The absorbents frequently used are cornmeal,

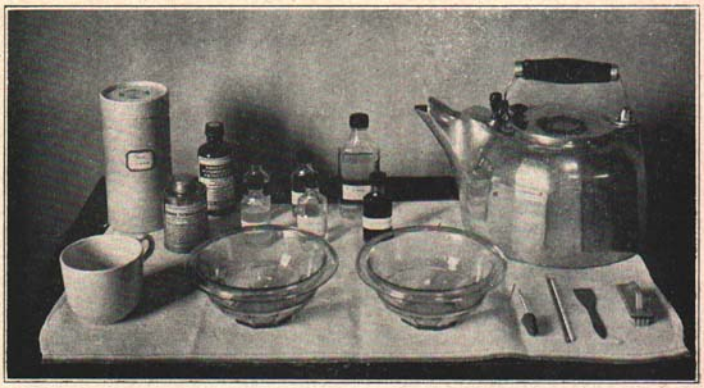

Fig. 4. Supplies and equipment for stain removal include: hot water, soap, solvents, bleaches, bowls, medicine dropper, glass rod, small spatula, brush, and pads of cloth.

powder or blotting paper. These are used to absorb fresh stains of grease or moisture.

The solvents commonly used to dissolve stains are clear water, soapsuds, carbon tetrachloride or other non-inflammable dry cleaning solutions, turpentine, kerosene and acetone. The stains are dissolved either by dipping the article in the solvent or by placing a pad of cloth under the spot and sponging with the solvent from the wrong side of the material.

Bleaches are used to remove stains that have changed the color of a fabric. All bleaches if used often or allowed to remain too long on a fabric will weaken the fibers. It is necessary, therefore, to always remove the bleach by thorough washing or by using another reagent to counteract the effect of the bleach on fibers.

Lemon juice, cream of tartar and **buttermilk** are household supplies sometimes used as bleaches to remove certain stains.

Hydrogen peroxide is a mild bleach which may be used on silk, rayon and wool, followed by sponging with clear water or by laundering.

Oxalic acid solution can be made by dissolving one teaspoonful oxalic acid crystals in one and one-half cupfuls of water. A stronger solution may be used if needed.

In treating stains with oxalic acid, stretch the stained portion over a bowl filled with hot water. Moisten with water and apply oxalic acid to the stain with a medicine dropper. Because it will weaken or rot fabric if not rinsed out, be sure to remove all of the oxalic acid by rinsing with clear water.

Javelle water, one of the common bleaches, should be used only on white cotton or linen materials, because it bleaches colors and rots silk, wool and some rayons. Apply in the same way as oxalic acid.

Javelle water can be prepared in the following manner: Dissolve one pound of washing soda in one quart of water in an enamel or earthenware vessel. Mix one-fourth pound of chloride of lime in another earthen or enamel vessel into a fine paste by adding a pint of water slowly. Add the chloride of lime paste to the washing soda solution. Stir several times at intervals of about an hour and allow it to settle over night. In the morning, drain the liquor from the heavy sediment and strain through a piece of muslin. Keep solution tightly corked in a glass container. Label plainly.

Potassium permanganate is a bleach used only as a last resort for removing certain spots from all white fabrics except rayon. Prepare and use the solution as follows: Dissolve one-fourth teaspoonful potassium permanganate crystals in one-half cupful water. Stretch the stained portion over a bowl of hot water. Moisten stain with water. Apply the solution to the stain with a glass rod or a medicine dropper. Let stand for 5 minutes. Rinse in clear water. Remove the brown color by applying oxalic acid solution. Rinse or launder to remove all of the acid from the fabic.

EQUIPMENT FOR STAIN REMOVAL

Equipment and supplies needed for stain removal are enamel or glass bowls, medicine dropper, glass rod, pads of cloth, a teakettle for boiling water, and reagents to use on the stain. The most commonly used reagents are carbon tetrachloride, Javelle water, oxalic acid, hydrogen peroxide and potassium permanganate. A supply of these kept in labeled bottles near the laundry area will help to make the job of removing spots an easier one.

INFORMATION NEEDED BEFORE REMOVING STAINS

Before applying a reagent to remove a stain it is necessary to know the fiber in the garment, the type of stain, the effect of the remover on the color.

Some removers harm certain fibers more than others. All bleaches will weaken any fiber if used too often or allowed to remain on the fabric too long.

The type of stain—sugar, fat, protein or chemical—determines the

method to be used to remove it. Sugar stains are removed with clear water. Fat stains are removed by warm soapsuds or a grease solvent such as carbon tetrachloride. Protein stains such as are found in milk, cream and perspiration spots are removed by washing first in clear cool water and then in warm soapsuds. Chemical stains such as ink, rust and medicine must be removed by a reagent suited to the particular stain.

If the material is colored the effect of the remover on the color must be determined. In some cases it may be less noticeable to remove the stain and some color than to leave the stain on the garment.

A fresh stain is always easier to remove than one which has been washed or ironed or which has stood for some time.

HOW TO REMOVE STAINS FROM WASHABLE COTTON AND LINEN FABRICS

Stain	Method of Removing
Black grease or tar	Scrape off as much grease as possible. Rub spot with lard or saturate spot with carbon tetrachloride or kerosene before washing the garment. Let stand. Wash in warm soapsuds. Rinse.
Blood	Soak in cold water. Then launder. If any yellowness remains, bleach with Javelle water. Rinse.
Cream	Wash in clear cool water. Then launder. If necessary bleach with Javelle water. Rinse.
Chocolate	Wash in warm soapsuds. If necessary bleach with Javelle water. Rinse.
Cod-liver oil	Mix equal parts of banana oil and a thick soap solution. Apply this mixture to the stain. Let stand for a short time. Launder garment. The white curds that form usually come out when the garment is laundered or acetone can be used to dissolve them. Do not use acetone on rayon.
Coffee	Wash in soapsuds. Then bleach with Javelle water. Rinse.
Egg	Soak in cool water and then launder.
Finger nail polish	Dissolve with acetone. Do not use on rayon fibers as it will dissolve them.
Fruit	Stretch stained portion over a bowl or cup. Pour boiling water on to stain from a height of two or three feet. Wash in warm soapsuds. If any stain remains, bleach with Javelle water. Rinse. CAUTION: Soap sets fresh fruit stains.
Grass	(1) Wash in hot water and soap. Bleach any remaining color with Javelle water. Rinse. (2) Wood or denatured alcohol will dissolve some grass stains. Apply before washing the garment.
Gum	(1) Scrape off as much of the gum as possible, then apply kerosene or carbon tetrachloride. Launder. (2) Rub spot with ice until gum hardens and can be scraped off. Launder.
Ink	Wash in warm soapsuds or soak in milk. If stain remains, apply oxalic acid, then rinse. On white goods, use Javelle water or oxalic acid. Rinse. Potassium permanganate followed by oxalic acid may be used on many fabrics. Rinse.
Iodine	Wash in warm soapsuds.
Lipstick	Wash in hot suds. If stains remain, bleach with Javelle water, oxalic acid or potassium permanganate followed by oxalic acid. Rinse.
Mercurochrome	Launder in hot suds. Bleach with Javelle water. Rinse. If stain remains, try potassium permanganate followed by oxalic acid. Rinse.
Mildew	Bleach with Javelle water. Rinse. Deeply grown mildew is almost impossible to remove.

Stain	Method of Removing
Paint	Sponge with or soak in turpentine or kerosene. Launder.
Perspiration	Soak in cool or lukewarm water to remove body protein. Then wash in hot suds. If stain remains bleach with Javelle water. Rinse.
Rust	(1) Apply oxalic acid or lemon juice and salt. Rinse at intervals and apply more remover. (2) Apply cream of tartar or oxalic acid to the moistened stain. Let stand. Rinse and apply again if necessary.
Scorch	Moisten with water and place in direct sunshine. Laundering will often remove light scorch. Deep scorch cannot be removed.
Shellac	Use wood or denatured alcohol (this may effect color) to dissolve stain.
Tea	Wash in warm soapsuds. Apply Javelle water. Rinse.
Wax	(1) Scrape off as much wax as possible. Press spot between pieces of blotting paper. Launder. If stain remains, bleach. (2) Apply kerosene and scrape off wax as kerosene is applied. Launder. If stain remains, bleach.

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