

# DAMAGE TO GARMENTS—CONSTRUCTION AND DESIGN

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## BANDINGS—SOFTENING

*Why does this occur?* Gripper bandings used for waist bands in trousers, skirts, and slacks are made of cotton or rayon band chain-stitched with several rows of synthetic and/or natural rubber thread. Various degrees of deterioration may occur, showing up as tackiness or change of color in the thread.

*When does this occur?* Cases on record show that tackiness may develop in wear or storage. In other cases tackiness may not show

up until after drycleaning, drying, and finishing of the garment.

*How may this be controlled?* To date it has not been determined what causes the gripper bands to soften. It has been established that solvent action alone does not cause the damage; nor does drycleaning followed by pressing.

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(Reference: NID Fabrics-Fashions Bulletin FF-12)

FIGURE 144

Some gripper waistbands become soft and sticky in wear and drycleaning. Note the cotton pocket is sticking to the softened rubber.



## COIL-TYPE CLOSURE OF NYLON—HEAT DAMAGE

*Why does this occur?* Excessive heat can melt a nylon coil-type fastener. Heat and pressure may collapse a coil fastener. In some cases drycleaning solvents increase the operating force necessary for opening and closing the coil-type fastener. The cord used to fasten the nylon coil to the cotton tape may shrink, causing puckering. Some tapes bleed color and stain the dress fabric to which they are attached.

*When does this occur?* Heat damage usually occurs in hand pressing. Damage is certain if the iron temperature goes above 420° F. Dissolving or loss of lubricant, swelling or shrinkage of the filament coil, swelling or

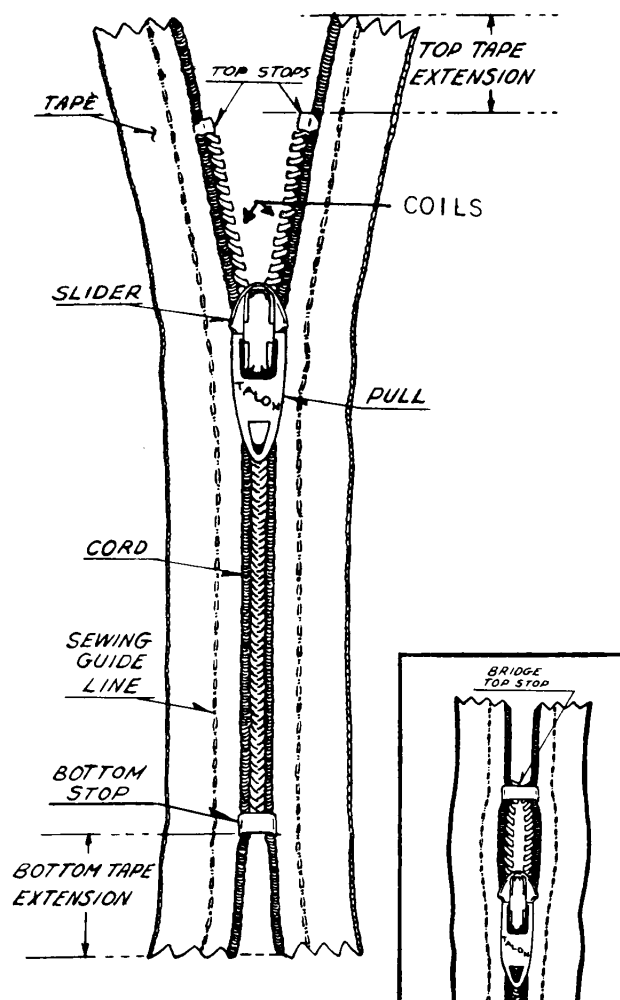
shrinkage of the cotton tape contribute to an increase of the operating force of the coil-type fastener.

*How may this be prevented?* Heat damage may be prevented by having the thermostat of the iron on the lowest possible setting. Place a press cloth over the fastener if the garment must be pressed at a higher than rayon setting. Using a zipper stick on the fastener will decrease the operating force and make opening and closing of the fastener much easier.

(Reference: NID Fabrics-Fashions Bulletins FF-107; FF-108.)

**FIGURE 145**

Nylon monofilament is shaped into two meshing coils, sewn onto corded edged tapes and combined to make a coil zipper. Sliders and stops are attached to complete the final product.



(Courtesy, Talon, Inc.)

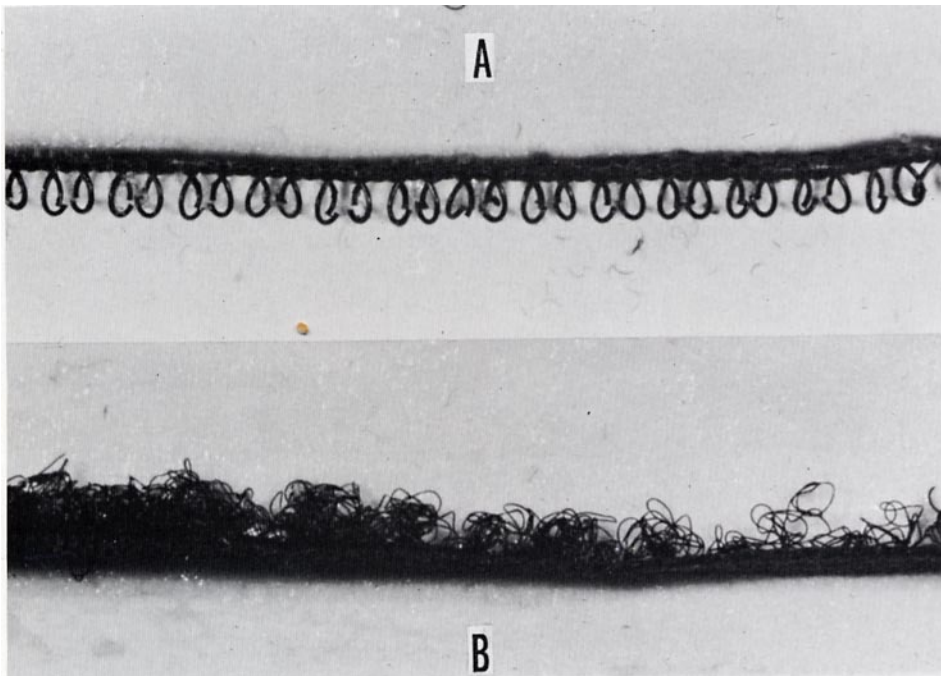
## "COCKLEBUR" TYPE CLOSURE OF NYLON—PHYSICAL DAMAGE

*Why does this occur?* Lint, fuzz or loose threads are picked up by the fastener very readily. They become tangled in the hooks or loops. Loss of hooks may result from abrasion.

*When does this occur?* Loss of hooks may occur during wear and in drycleaning. Lint, fuzz or thread pick up may also occur during wear and drycleaning.

*How may this be prevented?* Close the fastener before drycleaning. This will protect the hooks and avoid knocking them off through agitation in drycleaning. Closing the fastener will also prevent the pick-up of lint, fuzz or thread by the hooks.

(Reference: NID Technical Bulletin T-379.)



**FIGURE 146**

A row of each strip of a Velcro fastener, magnified about six times. To close the fastener the hooks of row A are pressed against the loops of row B. The hooks of row A are quite stiff and rigid, whereas the loops of row B are loose and tangled. A simple reading glass or similar magnifier is adequate to show the hook and loop structure of the fastener. All parts of the fastener are made of nylon.

## METAL CLOSURE—BROWN SPOTS AND HOLES

*Why does this occur?* This damage is traceable to slide fasteners that contain two different metals, for example copper and aluminum. When a slide fastener containing two different metals remains in contact with a damp fabric containing salts for a time, a chemical reaction (electrolysis) takes place, forming a strong acid. (22). This occurs when the water used to dampen the fabric contains salts. Many detergents contain such salts. If they are not rinsed from the fabric, they may serve as a conductor to produce a chemical reaction between the two metals used in the slide fastener. Liquid starch containing salts may also serve as a conductor to set up a similar chemical reaction.

*When does this occur?* This usually occurs in

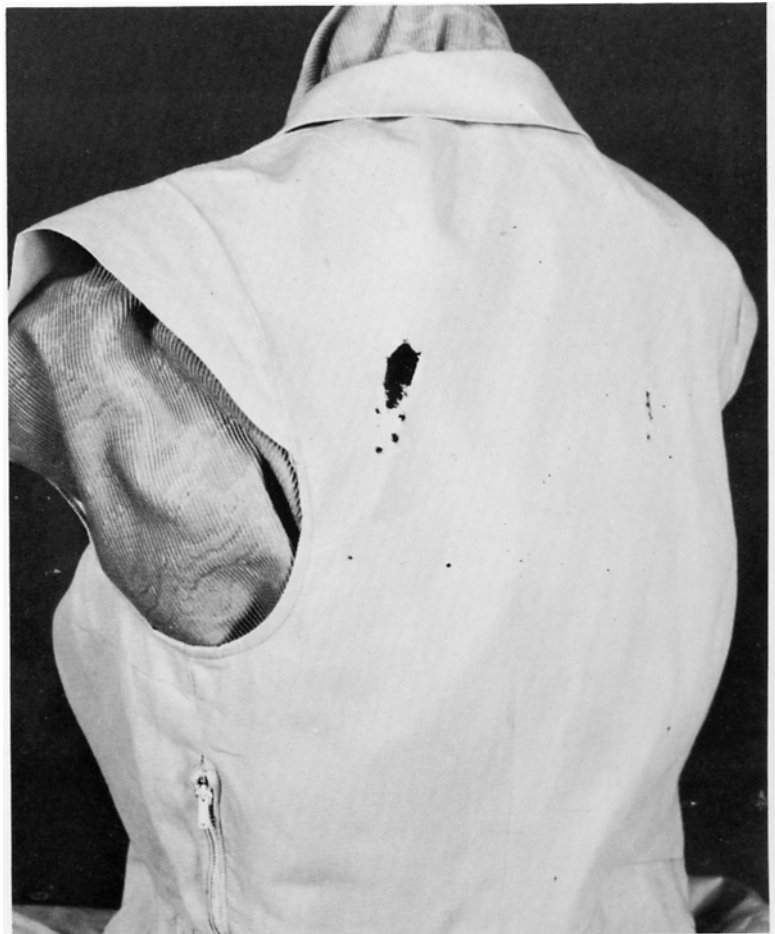
home laundering and ironing, when a damp fabric is permitted to lie in a rolled position for a period of time before ironing. Ironing produces brown spots that look like rust. These areas become weakened and may develop into holes. This type of damage may occur on cotton, linen, rayon, or acetate fabrics.

*How may this be prevented?* Accepted procedures in commercial drycleaning eliminate the risk of this type of damage. Care should be taken in home laundering and ironing to prevent this damage from occurring. Garments containing slide fasteners which may contain two different metals should not be rolled up while damp.

(Reference: NID Technical Bulletin T-293)

FIGURE 147

Brown spots that look like rust may be traced to the slide fastener in the garment. The spots are caused by acid that is formed by the metals present in the slide fastener and salts present in a dampened fabric. Sometimes these spots develop into holes as illustrated. In this case the damage occurred when the affected part of the fabric lay in contact with the metal slide fastener.



## HEM TAPE—REMOVED IN DRYCLEANING

*When does this occur?* Instead of stitching a hem to a dress fabric some hem tapes are pressed to the fabric under heat and pressure.

*Why does this occur?* The plastic coating of the tape is affected by drycleaning solvents. When the garment is drycleaned, the hem tape is removed. This makes it necessary to

re-hem the garment by stitching the hem tape to the dress fabric.

*How may this be remedied?* Garment manufacturers should use an adhesive on hem tape that is not affected by drycleaning solvents, or stitch the hem tape to the dress fabric.

(Reference: NID Fabrics-Fashions Bulletin FF-51.)



**FIGURE 148**

Hem tape coated with plastic material is attached to dress fabric with heat and pressure. The plastic-like coating is affected by drycleaning solvents.

## INTERLININGS—INTERFACINGS

Interlinings and interfacings are an important part of a well-constructed garment. The majority of these fabrics dryclean satisfactorily. Consumer dissatisfaction with interlining and interfacing materials may be classified as follows:

1. *Fabric disintegration*: In some cases the wrong weight of non-woven fabric is combined with the outer garment fabric. The interlining fabric becomes so weak it disintegrates or goes into shreds in wear and drycleaning.
2. *Discoloration*: Discoloration of non-woven interlining and interfacing fabrics may result from two causes:
  - a. The binding agent discolors with age.
  - b. Some of the fabrics attract and hold loose dye or soil from the cleaning bath.
3. *Spontaneous combustion*: Non-woven fabrics. See discussion page 516.
4. *Fiber batt bonded to woven lining fabric separates*: Fiber batts or sheets are bonded to a lining fabric. The bonding agent is soluble in drycleaning solvent. Drycleaning causes the batt to separate from the lining fabric.  
(Fabrics-Fashions Bulletin FF-78)
5. *Staining*: Stains develop on the outer fabric after wear and drycleaning. See discussion page 419-420.

**SHOULDER PADS, NON-WOVEN FABRIC  
(MATERIALS THAT MAY CAUSE  
SPONTANEOUS IGNITION)**

*Why does this occur?* Foam rubber padding and some non-woven fabrics used in garment design have caused spontaneous fires in dry-cleaning plants and in home or commercial dryers. This characteristic of some fabrics is not easily understood or explained.

*When does this occur?* In some cases this type of damage occurs while the garment is being dried in the drying tumbler; in others the garment has been removed from the tumbler and placed in a clothes hamper, without cooling, when fire occurs. (20)

*How may this be controlled?* Foam rubber pads should not be used in drycleanable garments unless they are recognizable and removable. Manufacturers of these hazardous products should study the causes of spontaneous ignition and formulate products that will not constitute a fire hazard. Approved practices in drycleaning and laundering may also help to control this problem. (21)

(Reference: NID Technical Bulletins T-190; T-212)



**FIGURE 149**

This stuffed animal was washed and dried in a home-type dryer. Spontaneous combustion of the sponge rubber caused damage to sheets, pillowcases, and towels.

**FIGURE 150**

Foam rubber used in shoulder pads, bras, and stuffed animals may reach the point of smoldering or burning under conditions of drycleaning and laundering. Some rug backings and non-woven fabrics have also been known to smolder and burn. (21)



## FUSABLE INTERFACING OR PRESS-ON LINING

*Why does this occur?* Non-woven and woven interlining fabrics may be treated with a thermoplastic self-adhering material such as polyvinyl acetate. It may be applied in an overall surface application or uniformly arranged pinpoint dots that give the surface a granular appearance and feel. The press-on lining eliminates the need for basting or temporary stitching in garment construction.

*When does it occur?* Fusable-type lining fabrics when used with lightweight and light colored fabrics may develop stains which show through on the fabric of which the garment is made. The stains look like mildew. They

are visible only on the side of the fabric to which the press-on fabric is placed. The discoloration or stains usually occurs after dry-cleaning and during pressing of the garment. Polyvinyl acetate has low thermoplasticity. The heat of pressing softens the adhesive. It may stiffen the outer fabric as well as stain it. The stiffening of the lined area is objectionable in appearance as well as hand.

*How may this be remedied?* Garment manufacturers should avoid use of self-adhering fusable-type interfacing fabrics on thin, light-colored fabrics.

(Reference: NID Reporter N-269; N-271.)

**FIGURE 151**

Stains from press-on linings look like mildew stains.





## LOSS OF PLEATS

*Why does this occur?* Pleat separation and removal may be traced to one or more conditions of fabric production, wear, or cleaning. They are: (1) fiber content of the fabric; (2) construction of the fabric; (3) the method of pleating used; (4) the condition of pleating (time, temperature, cooling, and method of forming); (f) garment design and fit; (6) conditions of wear; (7) method of cleaning.

*When does this occur?* Loss of pleats may occur in wear. For example, just sitting on pleats may cause them to separate. Perspiration or spilling a beverage on some pleated fabrics causes the pleats to separate and to be lost. Some pleats are lost in washing; others in drycleaning, drying, spotting, or finishing.

*How may this be controlled?* There is a need for a clarification of the term "permanently pleated." Pleated garments are expected to have some degree of pleat sharpness and smooth appearance after drycleaning. If pleats loosen up in wear and drycleaning, resetting of the pleats is necessary. Pleats that cannot be conveniently reset include: fluted, corrugated, pinch, crystal, mushroom, accordion, and petti-pleats. They can be reset by the manufacturer though this requires taking the garment apart, resetting the pleats, and then resewing the garment.

(Reference: NID Technical Bulletins T-259; T-285; T-301; and Fabrics-Fashions Bulletins FF-2; FF-49; FF-51.)

**FIGURE 152**  
Pleats that separate in wear and drycleaning require resetting.



**FIGURE 153**  
Use of water in spotting took the pleats out of this knit fabric. Such novelty pleats, once lost in wear or drycleaning, cannot be reset.



**FIGURE 154**

The blouse is made of the same fabric as the skirt of this garment, but it has been pinch-pleated. The pleated section is lined with a cotton lining fabric treated with a plastic-type sizing, the purpose of which is to prevent the pleats from relaxing in wear and cleaning.



*This garment should be dry cleaned. If pressing is needed, iron lightly on wrong side with a warm iron.*

**FIGURE 155**

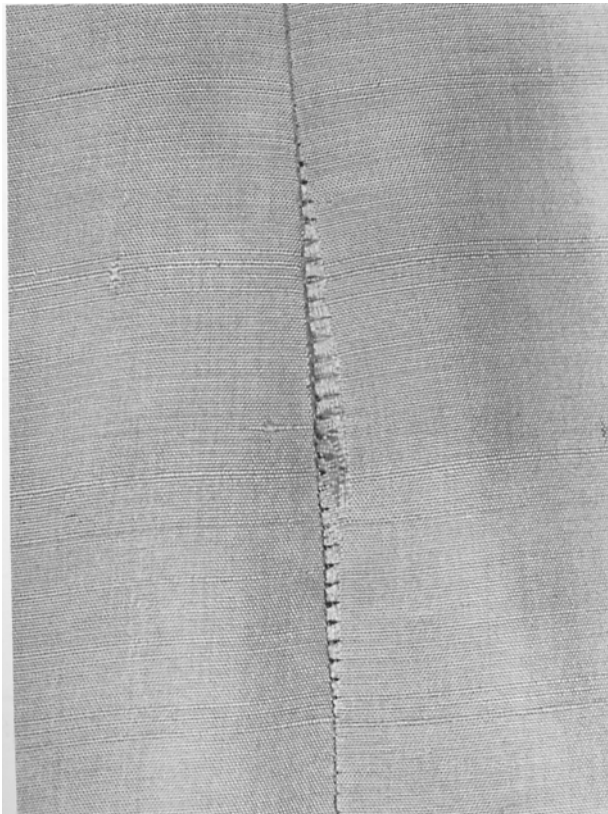
Cardboard hangtag attached to garments recommends drycleaning. When the garment is drycleaned, the solvent causes the plastic-type sizing to soften, become sticky, and separate from the dress fabric. This causes the pinch-pleats to relax, giving the bodice an over-blouse effect. (Fig. 154.) The lining separates from the dress fabric and sticks together. This makes finishing the bodice impossible.

## SEAM SLIPPAGE

*Why does this occur?* Seam slippage may occur in a garment or household item because of: (1) a low number of warp or filling yarns to an inch (known as thread count) in relation to particular yarn and fabric construction characteristics; (2) too shallow seam allowances (any strain on the fabric at the seams causes the yarns to shift); (3) too tight a fit (undue strain during wear may cause yarns to shift at the seam line); (4) improper seam construction (this could be too shallow a seam or not enough stitches per inch of machine stitching).

*When does it occur?* Seam slippage may occur during wear. Once started it is accentuated by cleaning. If the fabric is a low count, raveling easily and the seams are shallow, just the normal agitation required for cleaning may result in seam slippage.

*How may this be prevented?* Selecting fabrics that have a good resistance to seam or yarn slippage; using good methods of garment construction.



**FIGURE 156**

Strain on the fabric during wear at the seam line may cause the yarns of a low count fabric to slip and shift.

## SHOULDER PADS AND PADDING—DAMAGE

Shoulder pads and padding are an integral part of garment construction. They give shape and contour to a garment. The majority of pads perform satisfactorily in wear and drycleaning. Problems are in the minority but the ones that have caused consumer problems may be classed as follows:

1. Discoloration of the outer fabric. See page 432.
2. Disintegration of the pad and outer fabric. See page 457.
3. Spontaneous combustion. See page 516.
4. Deterioration with age.

*When does this occur?* Foam rubber constructions are used widely to give shape and contour to a particular dress design. The foam

rubber swells somewhat in drycleaning solvent. This does not damage the garment at the time of drycleaning.

*Why does this occur?* Cases are on record where cleaning followed by a period of storage has caused deterioration of foam rubber padding.

*How may this be prevented?* Deterioration of rubber products over a period of time is not an uncommon occurrence. With use and age some products harden; some deteriorate. If padding is required to last longer than the wear life of a garment, other materials should be substituted for the shaping or padding.

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(Reference: NID Fabrics-Fashions Bulletin FF-89.)

**FIGURE 157**

Many garments are padded with foam rubber to achieve the contour of shape desired in the dress design. The foam drycleans satisfactorily, but some foams deteriorate over a period of time in storage.



## STITCHING THREAD FAILURES

*Why does this occur?* Stitching threads that bleed during washing or drycleaning will stain the garment. Poor seam construction, puckering of the seams, and breaking of the thread may also result in dissatisfaction with an otherwise satisfactory garment.

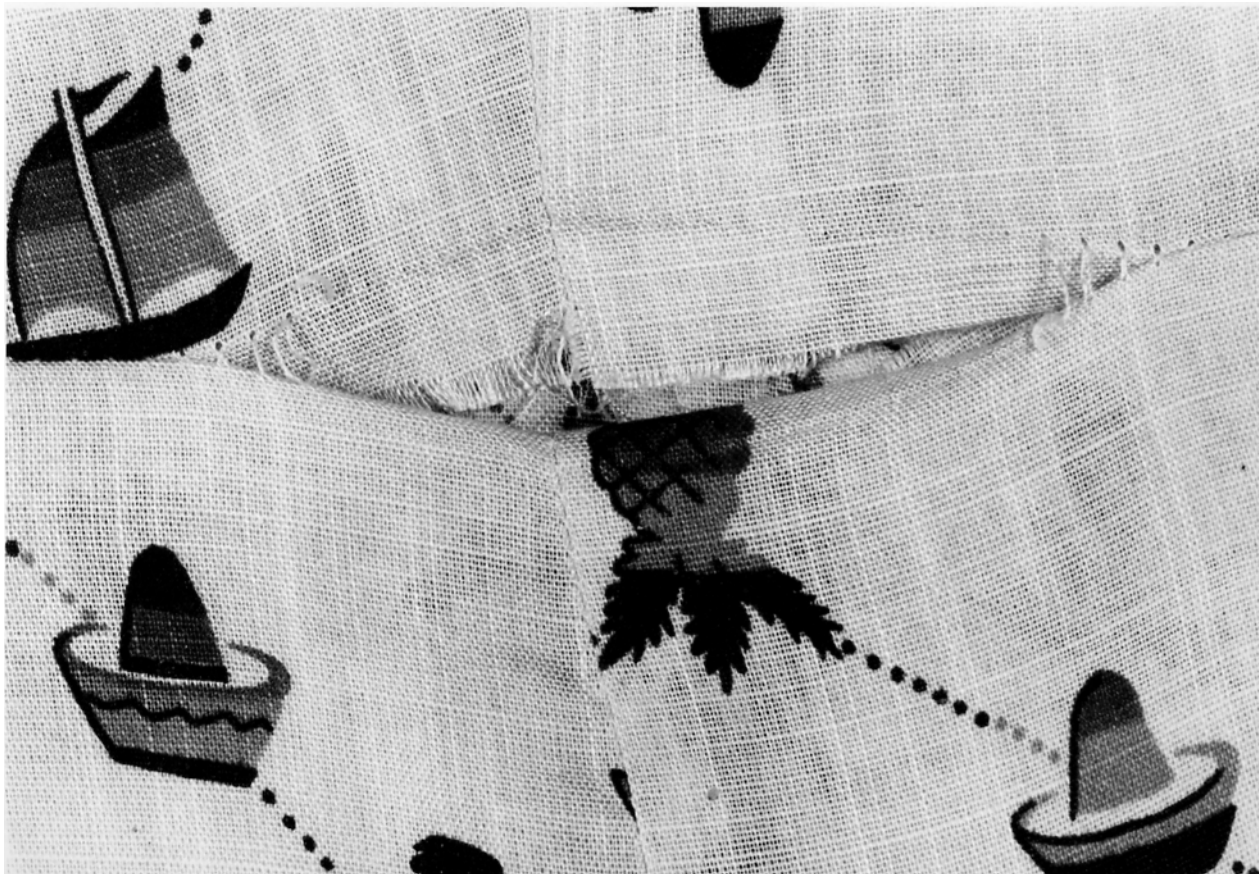
*When does this occur?* Different fabrics and garment design all present different prob-

lems of garment construction. Weaknesses in construction usually do not appear until after the garment has been worn and dry-cleaned, wetcleaned, or laundered.

*How may this be controlled?* Improved types of thread and methods of garment construction may serve to eliminate this problem.

FIGURE 158

Breaking of the stitching thread or shrinkage of the stitching thread may result in an unsatisfactory garment.



## WEBBINGS—LOSS OF ELASTICITY

*Why does this occur?* Some types of elastic webbings made of natural rubber are affected by the action of drycleaning solvent in combination with flexing of the webbing during cleaning. Heat in drying and finishing may also contribute to this type of damage. Synthetic rubber is not so affected. But it is claimed that synthetic rubber does not produce the elasticity desired in these webbings.

*When does this occur?* Some elastic webbings may lose their elasticity in the first drycleaning, while others may be drycleaned several times before loss of elasticity is noted. There is no way to predict when this problem will

occur. Many times the webbing is hidden between an outer fabric and a lining fabric of the garment.

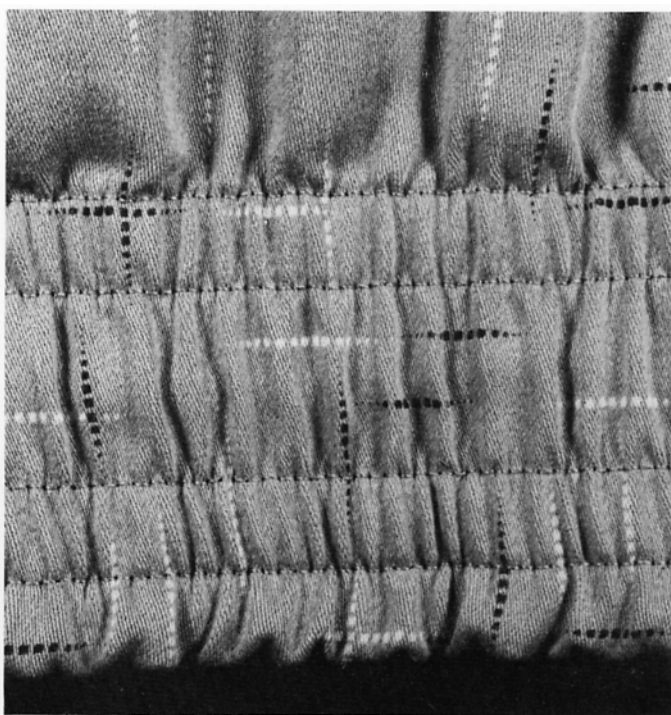
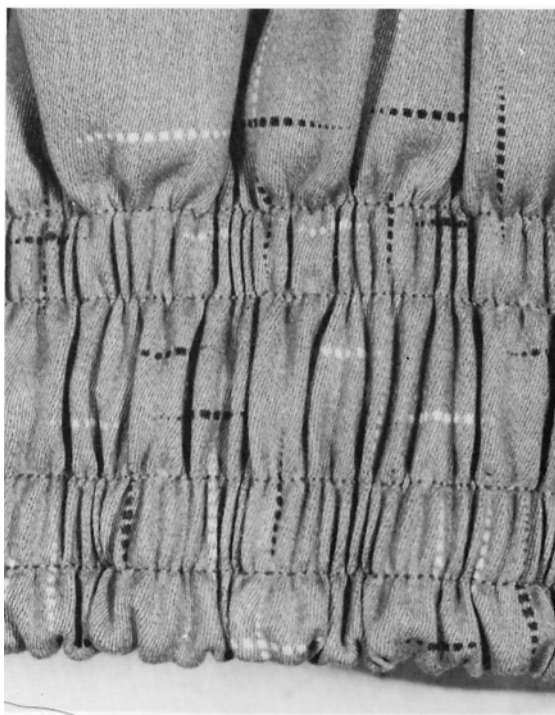
*How may it be controlled?* One theory advanced is that the type of construction contributes to this damage—it is claimed that if the rubber core yarns were not wrapped with a cotton yarn, the cutting action would be reduced. Further research on yarn structure is needed to develop a suitable elastic webbing that does not lose its properties after drycleaning.

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(Reference: NID Fabrics-Fashions Bulletin FF-5)

FIGURE 159

Elastic webbing is usually hidden between two layers of fabric. Left: Original waistband. Note the closeness of the gathers. Right: The same garment after drycleaning. Note gathers are not as close as in the original garment because the webbing has lost its elasticity.



# DAMAGE TO GARMENTS—TRIM

## BEADS—DELUSTERING ACETATE FABRIC

*Why does this occur?* Heavily decorated beaded dresses cannot be finished by hand pressing. They must be finished with steam from a puff iron or the buck of a press.

*When does this occur?* Too heavy or too long a steaming can result in moisture condensing under the trim. If the fabric is steamed while wet from this condensate, delustering of the acetate fabric results.

*How may this be remedied?* There is no way to restore the fabric to its original appearance, if it is impossible to get a hand iron under the trim.

(Reference: NID Fabrics-Fashions Bulletin FF-78.)

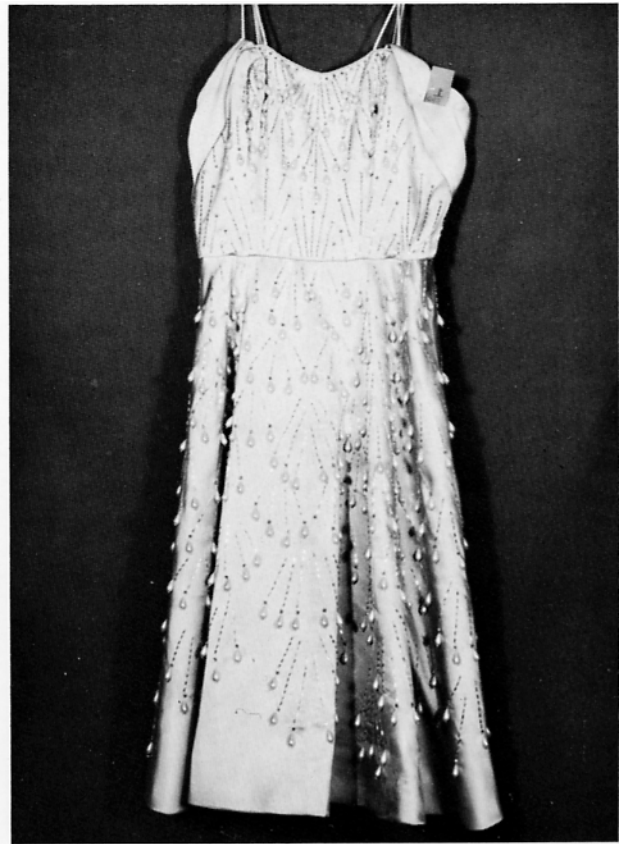


FIGURE 160

All-over beaded decoration on acetate satin requires special care in the finishing department.



FIGURE 161

Over-steaming can result in water condensation from the bead drops. Subsequent steaming may result in delustering of the fabric.

## BEADS—DISSOLVING

*Why does this occur?* Black polystyrene beads are sewn on or clamped on fabric to form decorative trim. The beads look like glass.

*When does this occur?* When the garment is drycleaned, the black polystyrene beads dissolve in drycleaning solvent. If the bead is not completely dissolved, it adheres to the fabric in a sticky mass.

*How may this be remedied?* Polystyrene trim should not be used on drycleanable garments. When the beads dissolve, melt and stick to the fabric it is all but impossible to remove the plastic and the colored pigment. With patience and effort, the plastic may be removed with paint removers and amyl acetate. It is not always possible to remove the black pigment.

(Reference: NID Reporter N-268.)

## BEADS—TARNISHING

*Why does this occur?* Some beads are tiny spheres or tubes of faceted glass with a hole in the center. The straight or tube types are called "bugle beads." Strings of beads are sewn to a fabric either with a machine chain stitch or by hand. A popular type of bead is made of crystal clear glass and silvered on the inside of the hole.

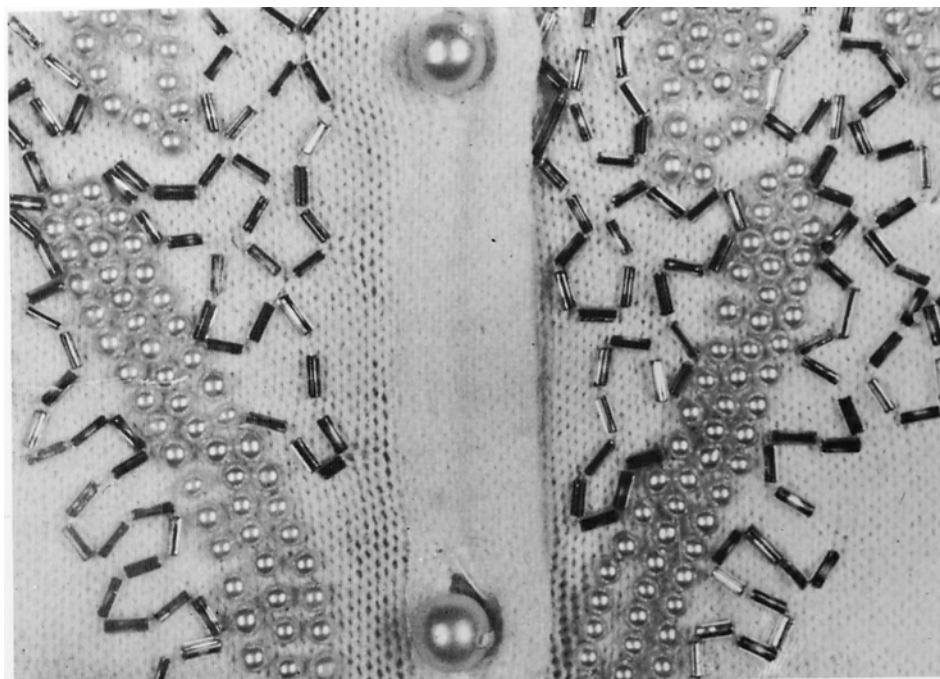
*When does this occur?* The silver surface tarnishes under certain conditions of use, drycleaning and storage. The silvered surface oxidizes and usually makes the bead appear black in color.

*How may this be prevented?* Silvered beads must be considered a luxury item with limited serviceability. To avoid disappointment, select another type of decorative trim.

(Reference: NID Fabrics-Fashions Bulletin FF-77.)

**FIGURE 162**

The silver sparkling bugle beads on this sweater were discolored in drycleaning. Oxidation of the silver coating makes the beads look black in color.





## BELTS—DAMAGE

*Why does this occur?* Belt problems are as varied as the materials from which belts are made. The plasticizing oils and adhesives used for some belt backings are softened or removed in drycleaning. This causes belts to stiffen in some cases; to separate in others. Many belt backings are made to resemble leather. This is usually a pyroxylin coated muslin glued to a cardboard insert strip to which the dress fabric is sewn. A rubber base adhesive frequently used in belt manufacture works through to the fabric side of the belt, staining it and making it unsightly.

*When does this occur?* During wear or drycleaning some belt backings may stiffen, ravel, or separate from the dress fabric. This may occur even with belts that are drycleaned separately or by hand.

*How may this be controlled?* Some belt manufacturers are making belt backings guaranteed to be washable and drycleanable. Garment makers can control this problem by using these products.

(Reference: NID Technical Bulletins T-54; T-186; Fabrics-Fashions Bulletin FF-75.)

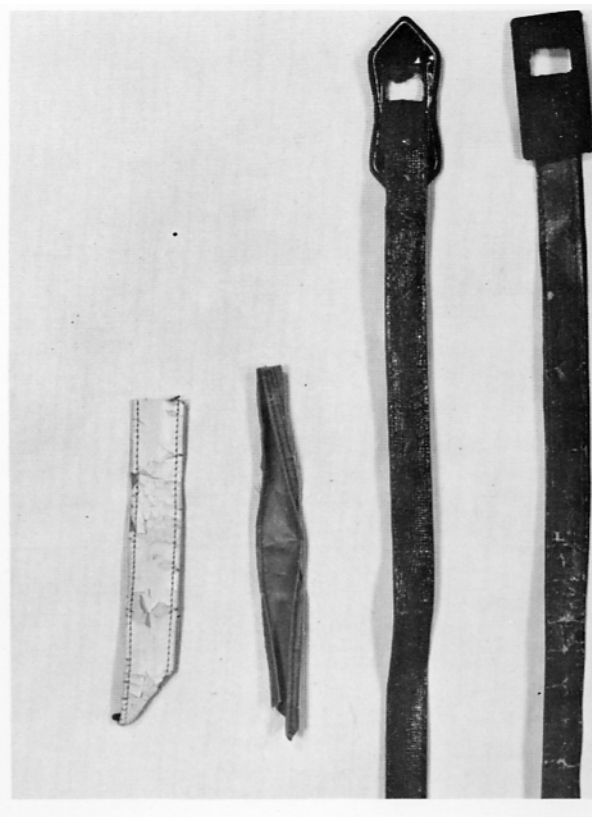


FIGURE 163

Some belt backings have proven to be unsatisfactory in wear and drycleaning. Note how the belts and portions of backing have stiffened and cracked in cleaning.

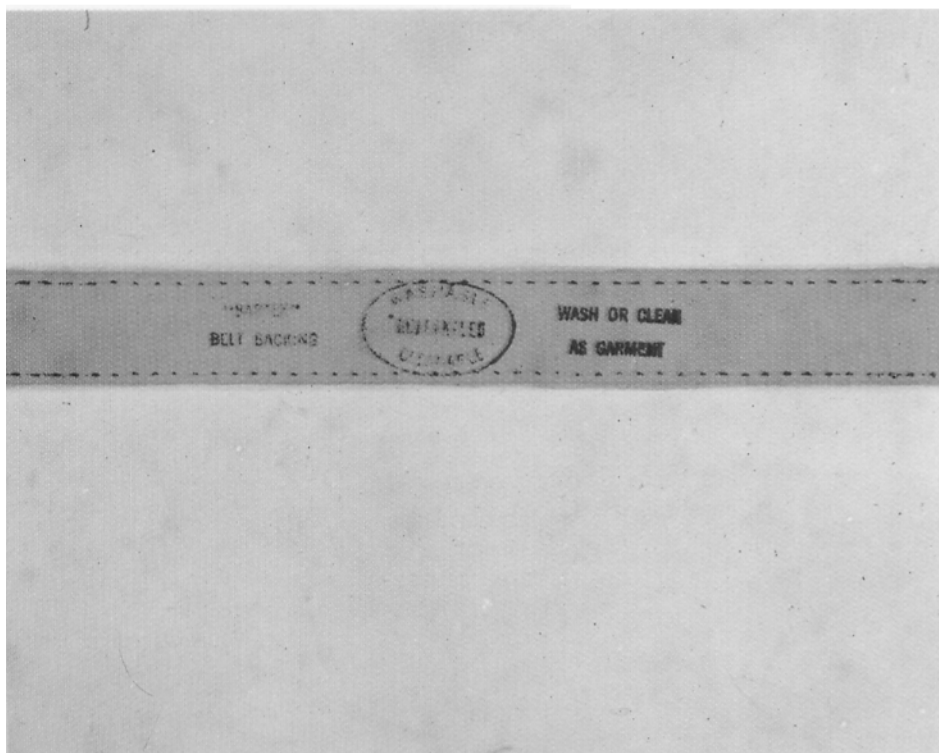


FIGURE 164

Some belt backings have been tested and have proven to be satisfactory for wear and drycleaning.

## BUTTONS—DAMAGE

*Why does this occur?* Buttons range from the strictly functional to the highly decorative type. They may present problems as varied as the materials from which they are made. Consumer dissatisfaction may arise from the following causes:

1. *Physical or Chemical Change*
  - Dissolving in solvent
  - Distortion or melting from heat
  - Fabric destruction due to volatilization
  - Chipping, cracking, crazing, peeling
  - Blistering, rusting
  - Warping, whitening, darkening
2. *Abrasion*
  - On fabric surface
  - On button surface
  - On sewing thread
  - On buttonhole
3. *Dyes*
  - Loss of color
  - Color bleeding and staining

Color destruction due to volatilization  
Staining from button liner

*When does this occur?* Depending upon the construction of the button, damage may occur in use, drycleaning, drying, or finishing.

*How may this be controlled?* It is a long and circuitous route from the manufacturer of button raw materials to the manufacturer of the button itself and on to the converter who buys and sells the button, and then to the manufacturer who selects the trim for finished garments. Frequently it is a route that is impossible to retrace. Concern by both producer and buyer regarding the durability and serviceability of buttons, and caution on the part of the drycleaner in removing and replacing buttons would help to control this problem.

(Reference: NID Technical Bulletins T-101; T-155; T-189; T-172; T-175; T-305; Fabrics-Fashions Bulletins FF-40; FF-76; Reporter N-268.)

FIGURE 165

Polystyrene buttons, buckles, and ornaments dissolve or soften in drycleaning solvent; distort with the heat of finishing or pressing.

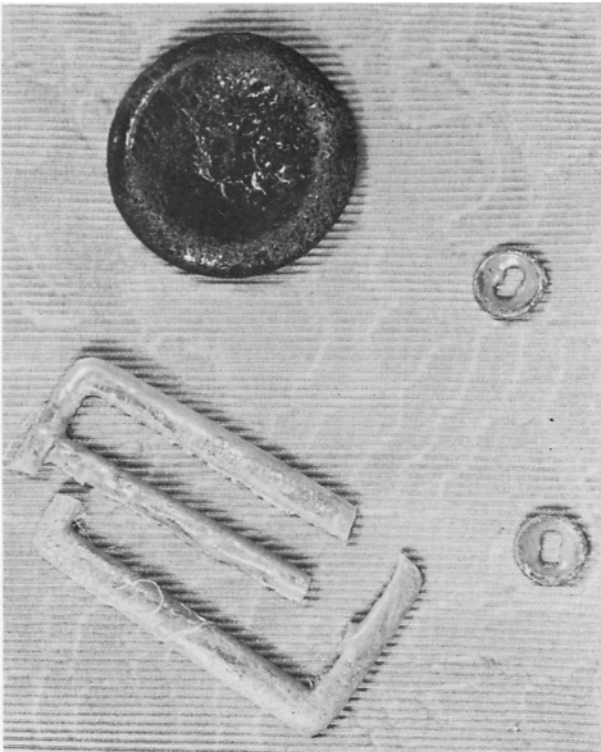
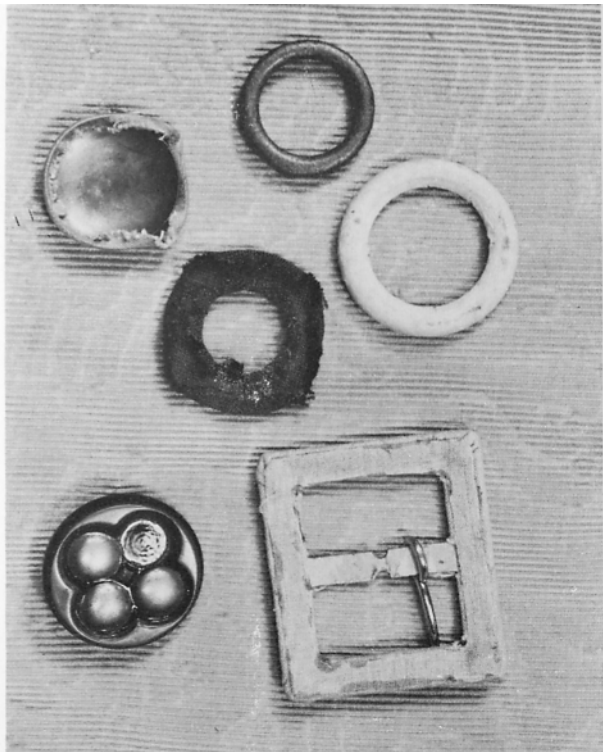


FIGURE 166

Some adhesives used to glue belt buckles, fabric to button shells, stones to button shanks, dissolve in drycleaning solvent.



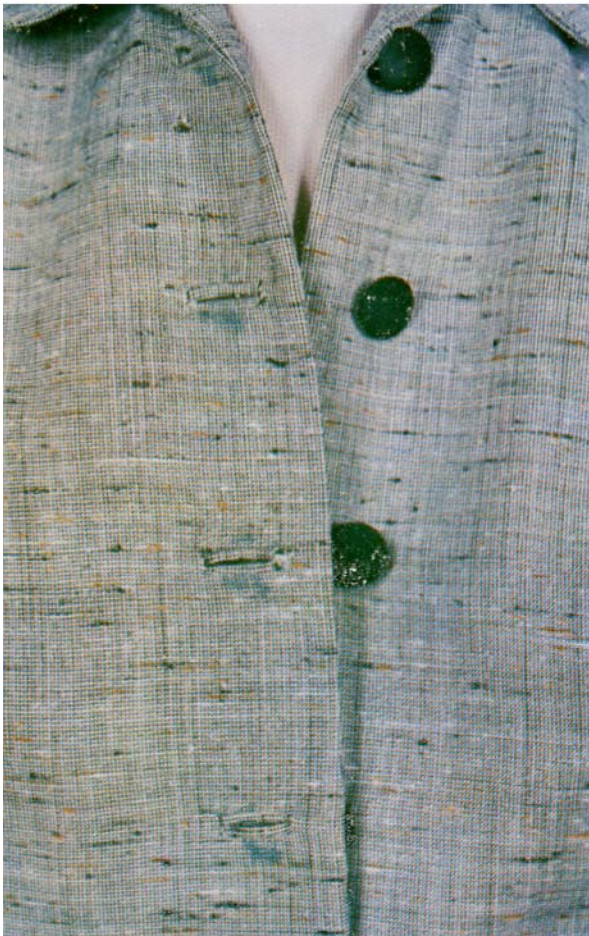
**FIGURE 167**

The covered button looks innocent but it cannot withstand dry-cleaning. The polystyrene may soften and partially dissolve in drycleaning.



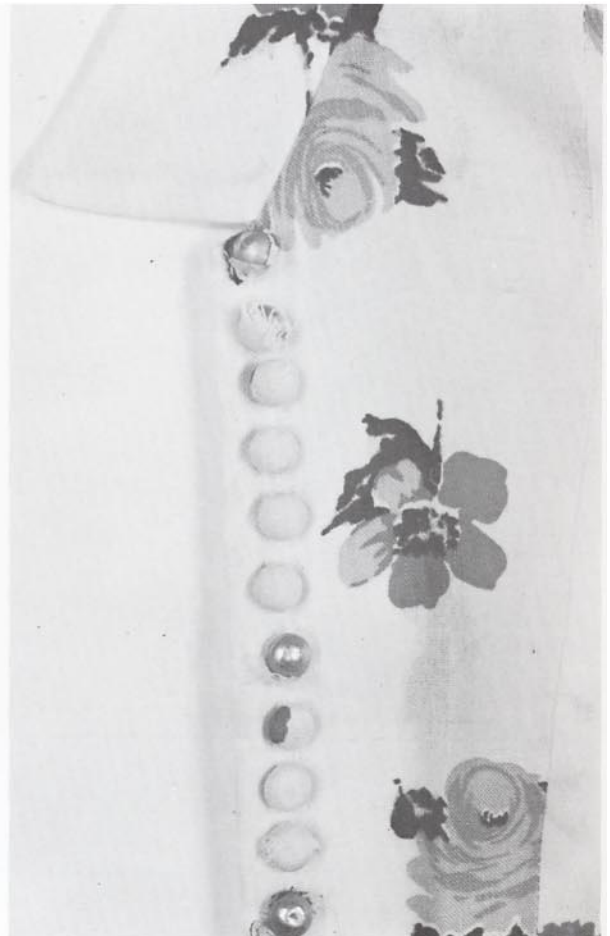
**FIGURE 168**

The steam required to finish fabrics is sufficient to cause some dyed buttons to bleed and stain a garment. These casein buttons bled in this manner.



**FIGURE 169**

Some fabric-covered buttons may be damaged from abrasion during wear and drycleaning.

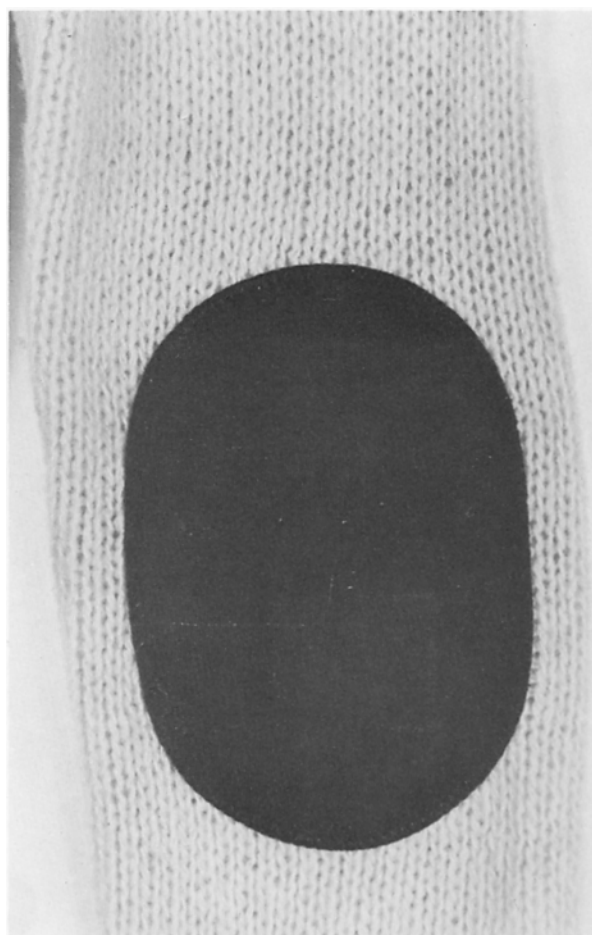


## ELBOW PATCHES—DAMAGE

*Why does this occur?* Elbow patches are used on sweaters, blouses, jackets, robes. They are made of grain leather, simulated leather or suede. Woven fabrics are also used. Most of the fabrics are ravel proof. Some of them have press-on backings.

*When does this occur?* Complaints result after the garment is drycleaned. Some of the leather patches bleed color that stains the surrounding fabric. Simulated leathers stiffen. Flocked suede made of expanded vinyl may stiffen and the flock separate from the base fabric. See page 410.

*How may this be prevented?* Elbow patches sewn to drycleanable garments should be made of a drycleanable material. This can be controlled by the garment manufacturer.



**FIGURE 170**

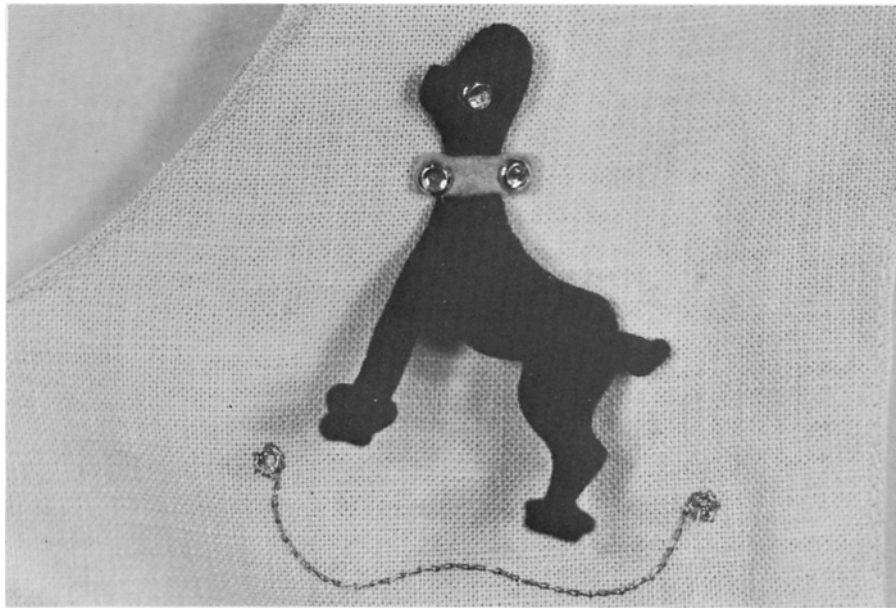
Elbow patches make fashion news. They are made of a variety of materials, genuine leather, or suede, simulated leather, expanded vinyls. The poor performance of the elbow patch frequently limits the serviceability of the garment to which it is applied.

## GLUED ON TRIM—REMOVED IN DRYCLEANING

*Why does this occur?* A quick method of adding a distinctive or contrasting design or trim to a fabric is done by the adhesive method. The design is actually “glued” to the fabric surface.

*When does this occur?* If the adhesive is solvent-soluble, the design is removed in drycleaning.

*Who is responsible?* Garment designers should require use of adhesives that are not affected by drycleaning solvents.



**FIGURE 171**

What looks like shadow is actually adhesive remaining in the fabric where the design was glued originally.

## POLYSTYRENE TEAR DROPS CLOUDING OR DISSOLVING

*Why does this occur?* A variety of materials are used for decorative trim. These items are usually not tested or labeled for dry-cleanability. The garment designer is usually not aware of the importance of this. He may select a washable trim and use it on a garment design that does not lend itself to washability. For example, a transparent glass-like teardrop made of polystyrene may become translucent when it is drycleaned, or a black polystyrene teardrop may completely dissolve.

*When does this occur?* Polystyrene is a plastic. Drycleaning solvents cause it to become

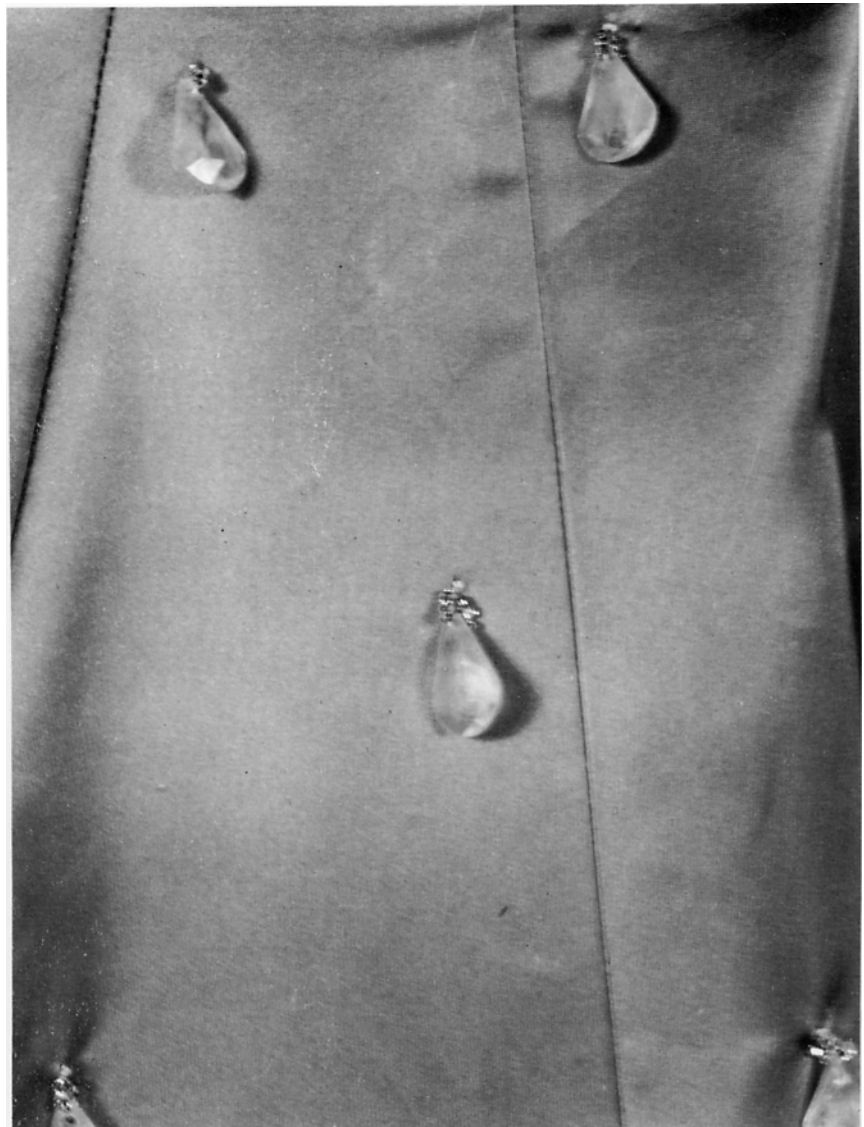
cloudy and translucent and in some cases dissolve it completely. The heat of drying or ironing will also soften this material.

*How may this be controlled?* This type of damage can be eliminated by making the correct choice of trim. Washable trim should be used on washable garments; drycleanable trim on drycleanable garments. Sometimes it is possible to remove the plastic but impossible to remove the colored pigment that stains the fabric. (See page 524.)

(Reference: NID Fabrics-Fashions Bulletins FF-6; FF-77; Reporter N-268.)

**FIGURE 172**

Clear glass-like teardrops, used to decorate some garments, becomes cloudy in appearance when drycleaned. They are made of polystyrene.



## DAMAGE TO SEQUINS

*Why does this occur?* There are many different materials and methods used in making sequins. The materials used may be classified as follows: mica (seldom used) is subject to cracking; metal (not used widely) is subject to corrosion; gelatin (used more widely in Europe) is very sensitive to moisture; polystyrene (desirable for brilliance of color) is affected readily by drycleaning solvents. Acetate is used most widely to make sequins and it has proven to be quite serviceable.

*When does it occur?* Mica sequins may crack and peel during wear and drycleaning. Metal sequins may tarnish and darken with wear; they may cause fabric damage because of

their sharp prongs; gelatin sequins become soft in the steam required to finish a garment and they cannot withstand water. Polystyrene sequins dissolve in drycleaning solvent; fortunately, they are not used widely.

*How may this be controlled?* The proportion of sequins on the market that perform satisfactorily is much greater than those that do not. There are tests that may be used to determine if sequins will withstand drycleaning. Sometimes it is impractical to make these tests on every garment decorated with sequins.

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(Reference: NID Technical Bulletin T-205; Fabrics-Fashions Bulletins FF-77; FF-78; FF-99.)

**FIGURE 173**

Three types of sequins have been used to create this design. One type drycleaned satisfactorily; the second type dissolved in drycleaning solvent; the third type distorted with the steam in finishing.

