May 14, 1935. C. T. GILBERT 2,000,943

WASHBOARD

Filed Dec. 8, 1934

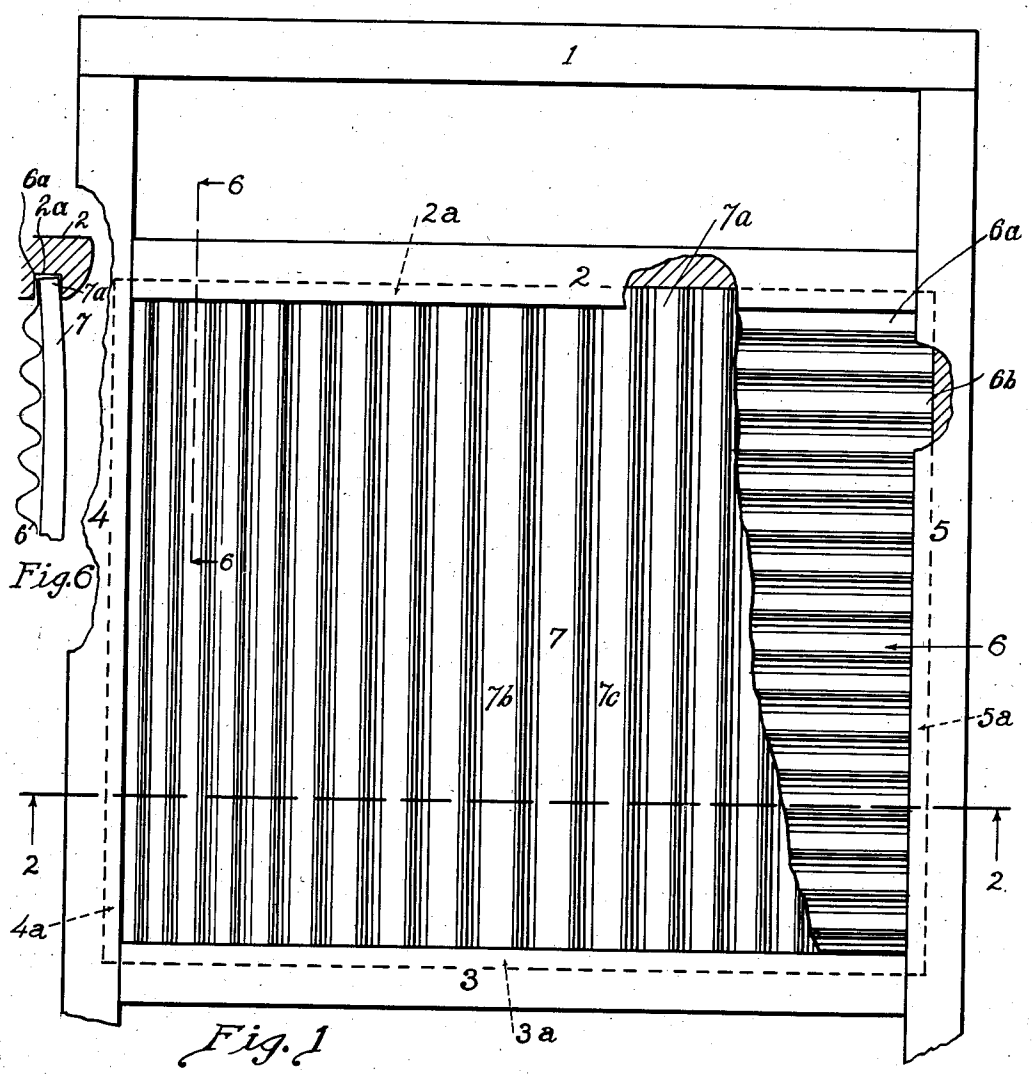

Fig. 1

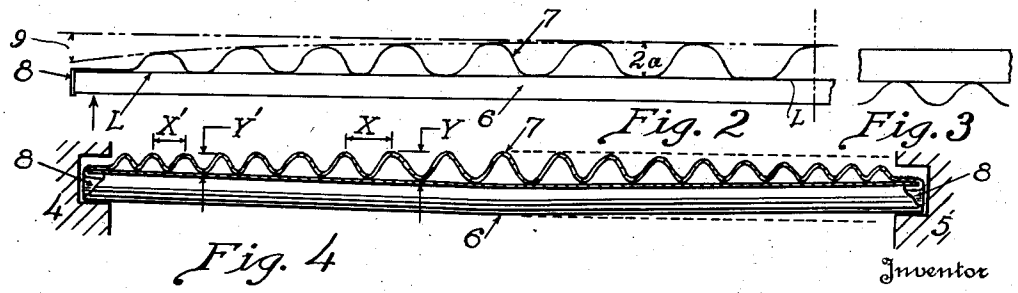

Fig. 2

Fig. 3

Fig. 4

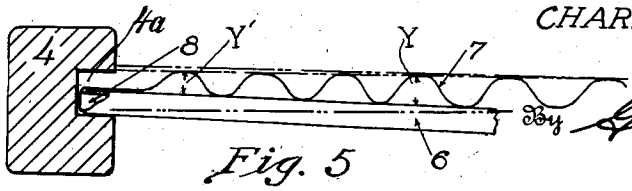

Fig. 5

Inventor

CHARLES T. GILBERT

By George B. Willcox

Attorney

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2,000,943

WASHBOARD

Charles T. Gilbert, Saginaw, Mich., assignor to National Washboard Company, Chicago, Ill., a corporation of West Virginia

Application December 8, 1934, Serial No. 756,649

4 Claims. (Cl. 68—29)

This invention relates to double-faced washboards characterized by rubbing surfaces made of two metal sheets corrugated and secured back-to-back with their channels lying in criss-cross relation to each other so that each rib of one sheet presents a beam-like support for each of the several ribs of the other sheet.

In my co-pending application, Serial No. 724,700, filed May 9, 1934 and now Patent 1,987,232 of January 8, 1935, I have described and claimed a double-faced washboard of that kind wherein each sheet gives to the other a backing such that both sheets may be made of material thinner than usual, yet the rubbing structure as a whole has adequate strength and rigidity for all conditions of use.

An object of my present improvement is to provide a board of the type referred to, but possessing certain novel and advantageous structural features whereby even greater stiffness is imparted to the double rubbing surfaces, permitting the sheets to be made still lighter without sacrificing strength or durability.

Another object is to cause each corrugated surface to maintain its contact with the other more closely by exerting spring-like pressure thereon. Another object is to produce such spring contact by arching or bowing one or both of the sheets out of its normal unstressed plane, and holding the edges of the sheets while under such stress, by means of the groove in the washboard frame.

The present improvement distinguishes from my earlier co-pending application by having the sheet whose ridges and grooves lie lengthwise of the direction of rubbing formed with deeper and consequently stiffer beam-like corrugations near its middle and shallower corrugations near the legs of the washboard.

The novel result attained by this arrangement is that the said stronger middle corrugations are firmly held at their bottom and top ends against the walls of the grooves in the bottom and middle rails of the frame. Consequently those corrugations will tightly engage and firmly support the middle area of the other sheet when the latter has been forcibly bowed or sprung so that the ends of its corrugations can be entered in the grooves of the legs.

Other objects of the invention appear later in the following description of a particular embodiment of the invention shown in the accompanying drawing, in which

Fig. 1 is a front view of a washboard embodying my improvements, the frame and one of the rubbing faces being broken away in parts.

Fig. 2 is an enlarged diagrammatic bottom edge view of the left-hand half of the rubbing plates shown in Fig. 1 as it appears when seen from below with the bottom rail of the frame removed.

Fig. 3 is a diagrammatic fragmentary side view of the parts shown in Fig. 2.

Fig. 4 is a sectional view on line 4—4 of Fig. 1.

Fig. 5 is a part sectional, part diagrammatic, view illustrating the slightly bowed shape imparted to the corrugated rubbing faces when they are seated in the groove of the frame, and indicating the resultant mutually stressed condition and the tight bearing contacts of the two plates thereby produced throughout the area of the washboard

Fig. 6 is a sectional detail, partly diagrammatic, taken on line 6—6 of Fig. 1.

In the washboard frame, the top rail 1, middle rail 2, bottom rail 3, and the legs 4 and 5 are of usual design, the members 2, 3, 4, 5 being formed on their inner faces with grooves 2*a*, 3*a*, 4*a*, and 5*a* that define a continuous channel of uniform width around the inside of the frame.

In the specific embodiment of my invention which I have chosen for purposes of illustration, sheet 6 has horizontal corrugations of uniform depth and of uniform width and pitch, and its non-corrugated top marginal edge 6*a* and its bottom edge are entered flatwise into the grooves 2*a* and 3*a* respectively along with the corrugated ends, as 7*a* of sheet 7, in the manner indicated diagrammatically in Fig. 6. The left-hand and right-hand marginal edges of sheet 6 present corrugations that are received and held in leg grooves 4*a* and 5*a* respectively, as seen at 6*b* on member 5, Fig. 1. It will be understood that the frame members are assembled around the rubbing elements in order to introduce the edges of those elements into the grooves.

The several corrugations of sheet 7 are preferably of varying depths, and may also vary in width and pitch. The deepest and widest, as 7*b*, 7*c*, are in the mid width of the rubbing area, the shallower and narrower corrugations being nearer the legs 4 and 5. In Fig. 4 the deepest corrugations are shown as of depth Y and pitch X, and the smaller corrugations are of depth Y′ and pitch X′. The deepest are preferably about equal in depth Y to the width of the groove 2*a*.

The principal area of sheet 6 is kept under stress or load by being bulged or sprung outwardly at its mid area over some of the deeper middle corrugations, as 7*b*, 7*c*, of co-operating

sheet 7. The sprung sheet 6 is held at its side edges by the leg grooves 4a and 5a.

The side marginal edges of plate 7 are also received flatwise into the leg grooves 4a, 5a. They preferably embrace and tightly hold the ends of the channels or grooves of plate 6 by means of locking tangs 8. That manner of fastening is described in detail and claimed in a co-pending application of Charles W. Sadenwater, Serial No. 737,484, owned by a common assignee and now Patent 1,987,217 of January 8, 1935. The advantages of thus fastening together the side marginal edges of the two sheets 6 and 7 are, convenience in assembling and preventing the rubbing surfaces from creeping relatively to each other when the washboard is in use. The top and bottom marginal edges of sheets 6 and 7 in grooves 2a and 3a need not be fastened together.

Sheets 6 and 7, after having been fastened together along their leg-engaging edges by tangs 8 but not yet mounted in the grooves of the frame, will lie flat as shown in Fig. 2 when laid on any flat surface. The top edges of all arrises of sheet 6 will then be straight and lie substantially in the same plane. Likewise the points of mutual contact of sheets 6 and 7 will lie in a horizontal plane, represented by the line L—L. After the ends of the deepest and strongest corrugations of sheet 7, as 7b and 7c, have been entered in the upper and lower grooves 2a and 3a, they act like strong beams capable of withstanding, with only a slight amount of deflection, the pressure brought upon them by the forcible bowing of sheet 6 which occurs when the side edges of 6 are sprung into the leg grooves 4a and 5a during assembling. This bowing of sheets 6 and 7 is indicated in Fig. 2 by the broken lines at 9.

Obviously, the ends of all the corrugations of sheet 7, both large and small, are received in grooves 2a, 3a. The large middle corrugations (Y) nearly or quite fill the grooves, as indicated by the broken lines, Fig. 5, and the ends of the smaller side corrugations (Y') are loose enough in the grooves to permit the bowing of sheet 6 in the direction of the arrow, Fig. 2. The side marginal edges of sheet 6 are received in the grooves 4a and 5a of legs 4 and 5 when its middle portion is sprung in the manner described.

The result of springing sheet 6 is to force its middle part tightly against the beam-like corrugations, as 7b, 7c, of sheet 7 and also to force the top and bottom ends of the smaller corrugations Y' of sheet 7 against the walls of the top and bottom rail grooves 2a and 3a. Hence at the bottom rail 3 and at the middle rail 2 the crests of all the arrises of sheet 7 are in a straight line, or nearly so, but half way between rails 2 and 3 the corrugations 7b, 7c assume a slight outward bulge because of the accumulated pressure on them of all the bowed corrugations of sheet 6. The resultant permanently stressed condition of the two sheets 6 and 7 is indicated diagrammatically but considerably exaggerated, in Fig. 4.

Sheets 7 with its corrugations progressively varying in depth and size from its middle toward its side edges has the further advantage that it attains improved efficiency and convenience in washing. For example, in washing heavy coarse material such as bath toweling, the relatively wide and deep corrugations in the middle part of the board afford the best washing surface because the heavier fabric can get down into the bottoms of the rubbing grooves. For washing lighter fabrics, as muslins, silks and linens, the shallower and more closely spaced corrugations adjacent the lateral edges of the surface are especially useful. It lies within the scope of my invention to employ sheet 7 alone in washboards.

The strength and rigidity of sheet 6 is greatly increased by being sprung to assume a slight outwardly convex curvature, and its weight and cost may therefore be reduced without danger of yielding or becoming deformed in use.

I have found that when sheet 7 is made of 100 to 115 pound stock the transversely corrugated sheet 6 may be made of 80 pound material.

For clearness in illustrating, the corrugations of both sheets are here shown as having smooth work-engaging surfaces, but they may be provided with appropriate embossments or indentations on their side walls, bottoms, and/or crests in known manner.

While I have shown and described only one embodiment of my invention, I am aware that various modifications of it may be made. My invention, therefore, is not to be restricted except in so far as may be necessitated by the prior art and the scope of the appended claims.

I have shown and described the edges of the composite rubbing element as being received in the grooves formed in the rails and legs and have explained the manner in which the ends of the middle corrugations or arrises, 7b, 7c are pressed against the walls of the upper and lower rail grooves 2a and 3a by the spring-like action of sheet 6 when the latter is bowed. I have also described how, by the same spring-like action, the corrugated ends of sheet 6 are caused to press against the walls of the leg grooves 4a and 5a, as at 6b. It is obvious that the pressure of arrises 7b, 7c is against the forward walls of rail grooves 2a and 2b as viewed in Fig. 1, and against the rearward walls of leg grooves 4a and 5a, so that the term "grooves" as here employed is intended to be understood as designating those walls against which the arrises 7b, 7c and the arrises of plate 6 take their respective bearings under the described spring action of the composite rubbing element.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a washboard having a frame and interiorly grooved rails and legs, in combination, a sheet corrugated to present arrises and channels extending throughout its length in the direction of rubbing, the ends of said arrises being engaged by the walls of said rail grooves, the arrises near the middle of the sheet being deeper than those near the edges thereof, a second sheet corrugated to present arrises and channels extending throughout its width and crosswise of the direction of rubbing, fastening means securing together in locked relation the marginal side edges of said sheets, said locked side edges being engaged by the walls of the leg grooves, said second corrugated sheet having bearing engagement with the middle arrises of the first sheet and with walls of the grooves in the legs whereby said second sheet is kept in a resiliently stressed condition and slightly bowed over the said deeper arrises of the first mentioned sheet.

2. In a washboard having a frame with interiorly grooved rails and legs, in combination, a sheet corrugated to present arrises and channels extending throughout its length in the direction of rubbing, the ends of said arrises being engaged in the grooves of said rails, the arrises near the middle of the sheet being deeper than those at

the edges thereof, a second sheet corrugated to present arrises and channels extending throughout its width crosswise of the direction of rubbing and having the ends of its corrugations received in the leg grooves, and mid-area of said second corrugated sheet being in back-to-back engagement with the middle arrises of the first sheet and having the ends of its corrugations in bearing engagement with the walls of the grooves in the legs whereby the said second sheet is kept in a resiliently stressed condition and slightly bowed over the said middle arrises of the first mentioned sheet.

3. In a washboard including a frame with rails and legs having bearing walls, in combination, a sheet corrugated to present arrises and channels extending throughout its length in the direction of rubbing, the ends of certain of said arrises near the middle of the sheet being in bearing engagement with and supported by walls of said rails, a second sheet corrugated to present arrises and channels extending throughout its width crosswise of the direction of rubbing, the mid-area of said second corrugated sheet being resiliently bowed in back-to-back engagement with the said middle arrises of the first sheet, the ends of its corrugations bearing upon walls of the legs in such manner that the said second sheet is kept in a resiliently stressed condition and slightly bowed upon the said middle arrises of the first mentioned sheet.

4. A washboard rubbing surface having corrugations extending lengthwise of the direction of rubbing, those corrugations in the mid-area of the rubbing surface being deepest, the others being successively shallower from the mid-area toward both lateral edges of the surface.

CHARLES T. GILBERT.