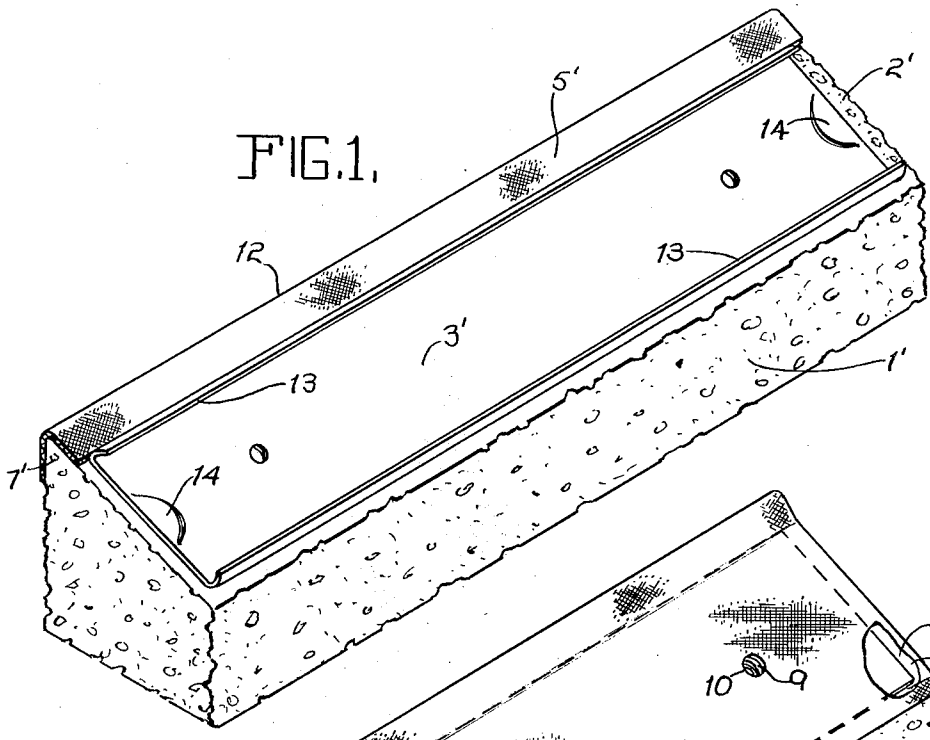
April 29, 1952 N. B. GREENLEAF ET AL 2,594,553

SPONGE ELEMENT AND BACKING THEREFOR FOR REMOVABLE ATTACHMENT TO A MOPHEAD

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FIG. 1.



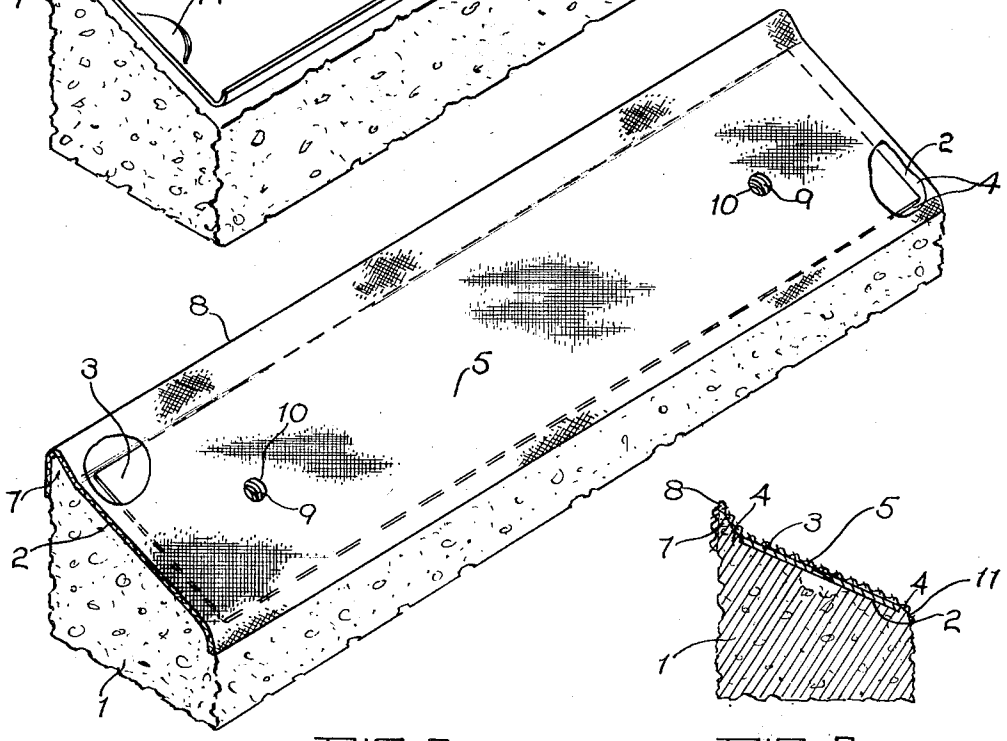


FIG. 2.

FIG. 3.

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SPONGE ELEMENT AND BACKING THEREFOR FOR REMOVABLE ATTACHMENT TO A MOPHEAD

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2 Claims. (Cl. 15—244)

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This invention relates to mopping elements for all types of mops including mops of the self-wringing type, and the principal object of the invention is to provide an effective mopping element which will be highly absorbent and will be extremely soft and pliable when mopping yet will have a permanency and strength to retain its shape indefinitely under repeated use to give a long life service.

A further and important object is to provide a mopping element in which the sponge absorbent body of the element will be permanently bonded to the backing and the backing construction will not only afford the element great strength and resistance to deformation but will further provide a strong and simple means of attaching the element to a mop head.

A still further object of importance is to provide a novel and simple furniture-protecting bumper along the forward upper edge of a mopping element, which bumper will be incorporated as part of the backing construction and while flexible and yielding under impact will have considerably more resistance to deformation than the body of the mopping element to prevent exposure of hard surfaces of either the backing construction or the mop head.

The principal feature of the invention consists in adhering a sheet metal plate centrally to the back of a sponge mopping element and adhering a fabric backing piece over the plate and to the sponge material exposed around the perimeter of the plate to permanently bond the sponge and plate together, the metal plate providing a permanency and strength to the mopping element and affording a means of readily securing the element to a mop head.

A still further feature consists in extending the fabric backing piece over and down the forward edge of the sponge element to provide a fabric fold rib at this edge with a quantity of the sponge material compressed between the fold and forming with the fold a rib yieldable under contact but sufficiently resistant to yielding to prevent exposure of the hard surfaces of the backing plate and mop head.

A further feature of the cushioning reinforcing rib at the forward upper edge of the mopping element is its strengthening of the element to resist deformation under compression of the sponge material to facilitate the wringing action in pressing the water out of the sponge.

A further feature of importance consists in cutting the sponge element to form a block of quadrangular cross section tapering from toe to

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heel to incline the upper surface to maintain a mop head and handle to which the block may be secured at a convenient and desirable angle for efficient mopping action, and at the same time presenting a substantially vertical forward edge to locate maximum vertical depth of sponge directly over the toe where maximum wear occurs, thereby materially increasing the resistance to wear and life of the block and at the same time affording more material to resist rolling under at the toe.

Referring to the accompanying drawings, Figure 1 is a perspective view of a mopping element incorporating a fabric fold stiffening rib along its upper forward surface in accordance with one part of our invention and showing an exposed reinforcing backing plate.

Figure 2 is a perspective view of an alternative form of mopping element with the fabric adhered over the backing plate to more permanently bond the backing plate to the sponge material and with the stiffening rib formed at the forward upper edge of the mop by the fabric fold.

Figure 3 is a vertical section of the mopping element of Figure 2.

In present replaceable mopping elements or mop pad refills no really satisfactory means of providing a permanent bond between the sponge material and the backing member, which forms the means of attaching the pad to the mop head, has been provided.

It is one specific object of the present invention to overcome this defect in present mopping elements.

Again while it has been appreciated that it is desirable to have the upper surface of the mopping element inclined for optimum mopping action and mop construction, previous tapered mopping elements have had the toe, formed by the cut surface and sloping forward surface, projecting at a substantial distance forward of the forward upper edge of the mopping element. Such tapered mopping elements or pads have a serious disadvantage in that the vertical dimension of the pad at the toe where maximum wear occurs is small and the toe consequently rapidly wears away, i. e. there is a relatively small volume of pad material at the toe to resist wear or to resist rolling under in the normal mopping action.

It is another specific object of this invention to overcome the above disadvantage by arranging the cut surface uppermost and presenting a substantially vertical forward edge to provide maximum vertical depth and volume of material at the forward edge or toe to resist wear and any

tendency to roll under thereby materially increasing the life and usefulness of the element for a given overall pad volume.

With reference to the drawings, particularly Figures 2 and 3, the mopping element is shown as a longitudinal block 1 of quadrangular cross section, the block being preferably cellulose sponge or other equivalent highly absorbing material. The block is bevelled rearwardly with the upper block surface 2, the cut surface, inclined rearwardly while the front and rear surfaces are substantially vertical. This particular shape is desirable in that it will be seen that the maximum volume of sponge material for any width of vertical section is directly above the toe where maximum wear occurs and where dirt accumulates.

Adhered to the upper surface 2 of the block is a sheet metal or other stiffening plate 3, the area of the plate being less than the area of the upper sponge surface to leave the borders or frame 4 of sponge material exposed around the perimeter of the plate.

Various suitable adhesives, which provide a bond even at boiling temperatures to which the mopping element may be exposed, are available such as cellulose acetate.

Adhered over and to the plate 3 is a tough, strong fabric 5 of canvas or other suitably equivalent material, and this fabric or cloth is adhered to the sponge material exposed around the plate 3, as shown in Figure 3.

The cellular formation of the sponge and the porous formation of the fabric permit the adhesive, which again is a suitable heat-resistant adhesive for instance cellulose acetate, to penetrate into the adjacent surfaces and to form with the penetration an extremely strong bond between the fabric and sponge material. This penetrating bonding effect is a greater bond strength than the bond obtained between either the sponge and plate or the plate and fabric so that the fabric serves to markedly increase the permanency of the bond between the plate and block 1.

As illustrated the forward edge of the fabric is extended beyond and folded over the forward upper edge 7 of the block 1 with the fabric fold 8 enclosing and compressing the sponge material of the forward edge 7.

This fabric fold 8 with the sponge material gripped therebetween forms a longitudinal rib along the forward edge of the block 1 and projecting forwardly of the forward edge of the stiffening plate 3. Due to the fold of the fabric this has a stiffness considerably greater than either the stiffness of the fabric alone or the sponge material. The stiffness and resistance to yielding affords an ideal bumper effect whereby the fold 8 defining the rib will yield sufficiently upon contact with a hard surface, such as a furniture piece or the like, to prevent damage to the piece yet will not yield sufficiently to uncover or expose either the hard forward edge of the stiffening plate 3 or the hard surfaces of a mop head to which the mopping element may be secured.

The fold 8 serves a further purpose in that the forward upper edge 7 of the sponge material is contained and restrained to prevent this forward edge from overflowing or bending around the forward edge of the plate 3 when the sponge material of the block is compressed in the wringing action.

This resistance of the fold portion 8 to deformation of the sponge material at the forward edge of the plate 3 serves, in addition to increasing the wringing action of the mop by holding the forward edge against displacement under compression, to prevent this portion of the sponge from tearing from the plate 3 during the compression of the mopping element in the wringing action.

Formed in the stiffening plate 3 in spaced relation are the orifices 9 to receive suitable screws carrying sheet metal threads to permit the mopping element to be removably secured to a mop head. The orifices 9 are exposed through registering openings 10 in the fabric. As will be evident from Figures 2 and 3 the surface of the plate 3 is transverse the axis of the threaded orifice 9 and it will be understood that in securing the element to a mop head such a relation will permit the plate to be drawn into clamped relation with the mop head upon tightening of the screw threaded attaching means.

With this construction an extremely inexpensive and economical form of mopping element is provided, yet the use of the metal stiffening plate adhered to the upper surface of the block 1 ensures a solid, strong backing for the sponge material, giving a permanency to the shape of the mopping element against distortion under repeated and extended use.

The stiffening plate 3 also affords a means of ready attachment of the mopping element to a mop head from a position centrally of the width of the element and its own bond to the sponge material augmented by the bonding affect of the fabric 5 adhered over the plate and to the sponge material surrounding the plate provides a durable integral mopping unit. Moreover while the plate 3 gives the desired resistance to deformation of the sponge, the fabric 5 when distorted under wringing action will operate in permitting the sponge border along the plate to deform to urge the plate into closer engagement with the sponge.

If desired the fabric 5 may be extended down over the rear upper edge 11 of the block 1 to further increase the bond between the fabric and the sponge material at this edge to preclude any relative separation under the compressing or squeezing of the mopping element.

A further form of the mopping element may utilize the stiffening plate 3 adhered to the surface of the fabric, the functioning of the stiffening plate and the fabric fold 8 forming the bumper rib being the same as described. This construction may be utilized where the strength of the bond required between the stiffening plate and the block 1 need not be as strong as in the element illustrated in Figures 2 and 3.

This modification may be extended to provide the mopping element of Figure 1 wherein the block 1' corresponding to the block 1 has only the sponge material at the forward upper edge 7' bonded to the fabric 5', the sponge material at 7' being compressed and securely bonded within the fold of the fabric 5' to define the forward bumper rib 12 corresponding to the rib 8 of Figure 2.

The stiffening plate 3' is again bonded directly to the upper surface 2' of the block 1', and it will be seen that the area of the plate 3' is less than the area of the surface 2' to provide a frame of sponge material around the plate. While this material exposed around the perimeter of the plate 3' is not utilized as the bond surface, as in the mopping element of Figures 2 and 3, it does afford a soft, yielding bumper surface to prevent furniture pieces from accidental damage on contact with the ends or rear of the mopping element. The forward bumper 12 of course acts in the same manner as the bumper rib defined by

the fabric fold 8 on the illustration of Figure 2 to protect the furniture even from severe impacts by the forward edge of the mopping element.

The stiffening plate 3' in the illustration of Figure 1 is shown with longitudinal rolled edges 13 which define interlocking channels to interlock with a mating plate or mop head, and the upturned spring projections 14 form means to resiliently lock the mopping element in position on the mop head, as clearly described in United States Patent No. 2,515,403.

The stiffening plate 3' shown in Figure 1 may, as will be readily appreciated, take any form to facilitate interconnection with a mop head but its use will add the permanency and strength to the mopping element, and at the same time afford a rigid backing to assist, together with the rib 12, in the compression of the sponge material.

What we claim as our invention is:

1. A mopping element for removable attachment to a mop head comprising as a complete unit an elongated block of sponge material having a bottom working face and an upper backing-receiving face, a substantially flat sheet metal plate adhesively secured to said backing-receiving face and extending substantially the entire length of said block and having the longitudinal edge portions thereof lying flat on said backing-receiving face with the edges of said portions exposed and free of edgewise penetrating contact with the sponge material, said plate being of an area less than the area of said backing-receiving face and defining along at least the longitudinal edges thereof appreciable borders of sponge material free of and deformable out of the plane of said backing plate, a flexible cloth sheet adhered over said plate and to said sponge borders at the longitudinal edges of said plate, said sponge borders upon deforming under pressure away from the plane of said plate in a direction to strain the the bond between said plate and sponge drawing said flexible cloth adhered thereto in a direction to draw said plate against said sponge, and screw-threaded attaching means located centrally on said plate between said longitudinal plate edges and spaced longitudinally of said plate and exposed through said sheet in position for connection with a mop head on selection of said element, said screw-threaded attaching means being surrounded by backing plate areas disposed transverse the axis of the screw threads of said attaching means adapted to be brought into clamping relation at spaced points with an overlying mop head under screw pressure applied through said attaching means while leaving the longitudinal edges of said plate free of rigid connection with the mop head.

2. A mopping element as claimed in claim 1 in which said block of sponge material has elongated front and rear faces in respect to direction of forward and rearward movement under normal mopping action with at least said front face at right angles to said bottom working face to define therewith at the front a right angled toe, said upper backing receiving face being bevelled rearwardly forming an acute angle with said front face, said block presenting maximum vertical dimension at said front face with maximum sponge depth directly above said right angled toe.

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