

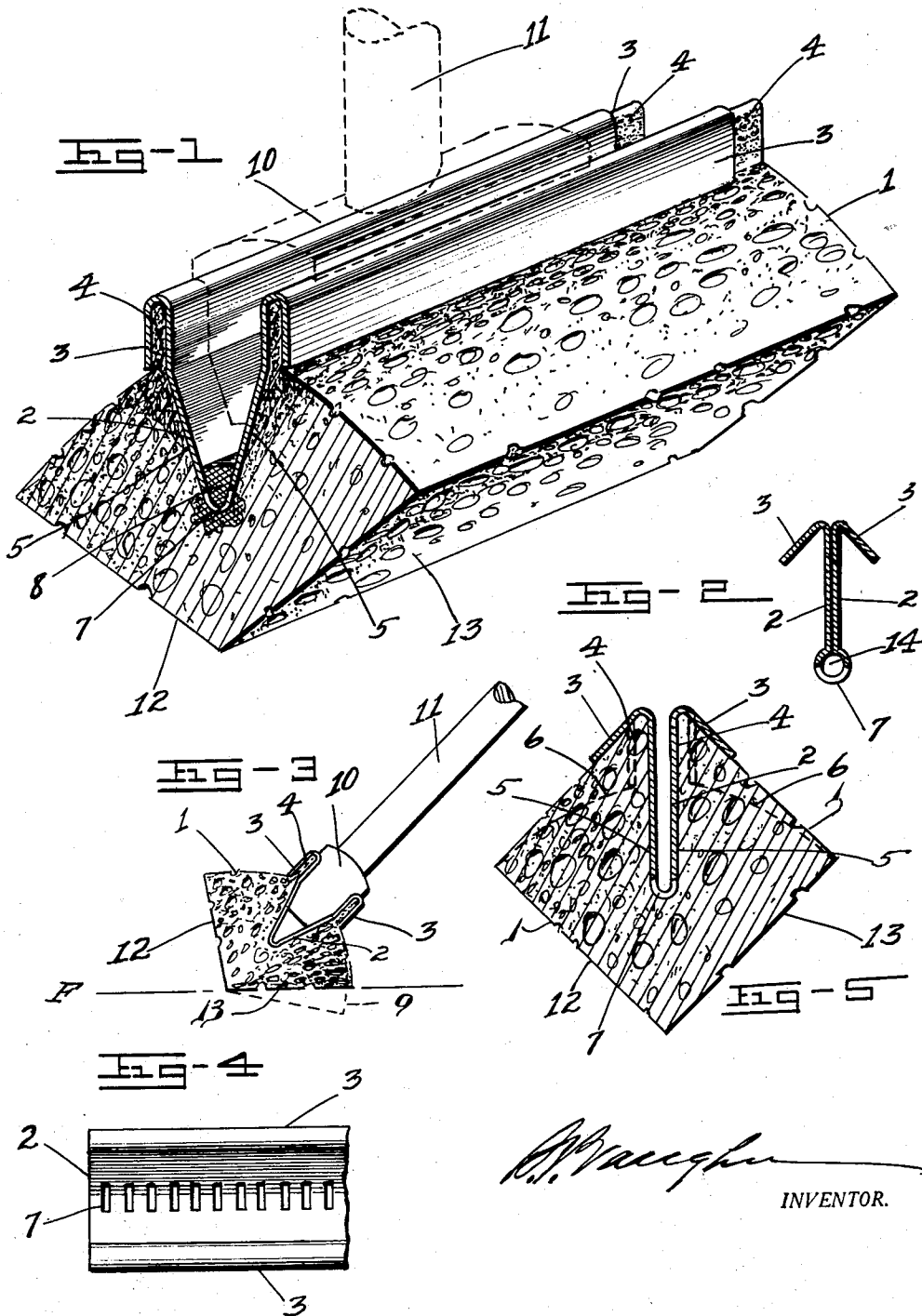
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CLEANING DEVICE

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CLEANING DEVICE

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4 Claims. (Cl. 15—244)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to cleaning devices such as mops and brushes embodying a compressible cleaning element such as sponge and felt.

Heretofore sponge and felt material in sheet form has been attached by various means to many types of backings. The prevailing method is to wrap a rectangular sheet of sponge or felt material around a backing or holding member and to clamp it thereto in some manner by clamps. Another method is to cut the material into thick strips of proper dimensions and to clamp one edge of the strip in a clip. In this invention an improved method has been devised which is particularly suitable for attaching cellulose sponge to a stiff backing.

In this invention cellulose sponge is the preferred form of cleaning element forming a part of the cleaning device, although any other suitable material such as rubber sponge or felt may be used. Cellulose sponge is soft and pliable when wet, yet fairly hard when dry. It shrinks considerably when dried and expands in proportion when wetted. In view of this, special means must be provided for attaching it to a stiff backing or holder, and special means must be provided to stiffen the sponge when a large portion is used as the cleaning element. Also means must be provided whereby the forces applied in cleaning operations will not accentuate the distortion, and which will prevent the sponge rolling over the surface being cleaned when the direction of forces are changed.

In a copending application for a cleaning device, filed December 21, 1937, Ser. No. 180,989, I show a method of increasing the stiffness of the sponge by providing a flexible core, also means for attaching the sponge to a stiff backing. In this invention I show a form of construction whereby, in cleaning operations, the forces are so applied that distortion is reduced to a minimum.

The principal object of this invention is to provide novel means for attaching a compressible cleaning material, such as cellulose sponge, to a backing or holder in such a manner that a minimum amount of cleaning material is used in attaching the sponge to its backing.

Another object is to attach cellulose sponge to a stiff backing or holder in such a manner that it may be successfully used in various types of cleaning devices, such as mops, brushes, and the like.

A further object is to provide in a cleaning device embodying cellulose sponge as the cleaning element, a form of construction that will eliminate abnormal distortion of the sponge when the direction of forces applied are changed such as would be the case when the cleaning device is used in scrubbing floors, and the cleaning ele-

ment has a tendency to roll over the floor when the direction of stroke is changed.

A further object is to provide a backing for a cellulose sponge cleaning element which can be readily attached to any suitable form of holder such as a mop head.

A further object is to provide a cleaning device for scrubbing floors, walls, ceilings, windows, etc., that is cheap, yet exceptionally efficient in operation.

Other objects and advantages of the invention will become apparent from a study of the following description taken in connection with the accompanying drawing, wherein:

Fig. 1 illustrates a perspective view of the cleaning device made in the preferred form according to the present invention, wherein one end is shown in section to illustrate clearly the form of construction.

Fig. 2 illustrates a cross section of a modified form of backing partially formed.

Fig. 3 illustrates a side view of the cleaning device in operative position and attached to a conventional form of mop head.

Fig. 4 is a plan view of a section of the backing showing openings which are utilized for cementing a part of the cleaning material to its backing.

Fig. 5 is a sectional view of the cleaning device illustrating method of assembling the various parts.

Like numerals refer to like parts throughout the several views.

The cleaning device includes a cleaning element 1 preferably made out of an elongated block of cellulose sponge or other compressible material such as rubber sponge or felt. The block of cleaning material is originally substantially square or diamond shape in cross section and is slitted lengthwise on a cross section diagonal line so that the slit 5 will extend in depth from one of the elongated corners to a line substantially coinciding with the longitudinal axis of the block as illustrated in Fig. 5.

The backing for the cleaning material is made preferably of sheet metal and comprises an elongated channel member 2 V shaped in cross section with the edges 3 of the V shaped channel turned or flanged outwardly and downwardly to form U shaped channels on both sides of the V to receive the edges 4 of the walls of the longitudinal slit 5. The backing is first formed U shaped in cross section with the edges flanged outwardly and downwardly at an angle of about 45 degrees as illustrated in Fig. 5. In assembling the cleaning device the U shaped backing or channel is first inserted in the slit 5 with the flanged portions resting on the edges of the slit as illustrated in Fig. 5, after which the flanged edges 3 are compressed laterally to grip tightly the edges 4 of the cleaning element as indicated

by the dotted lines 6. After the flanges 3 of the backing member have been clamped tightly, the walls 2 of the U shaped channel are flared outwardly to form a V shaped channel as illustrated in Fig. 1. The middle portion of the cleaning element is secured to the bottom of the V shaped channel by a rubber cement 8 poured into the channel. The rubber cement passes through openings 7, cut in the bottom of the channel, and makes contact with the cleaning material. When the cement has set or has cured, the cleaning material is securely attached to the backing.

If the middle portion of the block of cleaning material adjacent the bottom of the V shaped channel was not securely attached thereto, the cleaning material, especially if made of cellulose sponge, would have a tendency when wet to crawl around the backing when the direction of stroke is changed in cleaning operations. This would result in rapid wear at that point. While I have shown the bottom of the V shaped channel secured to the middle portion of the cleaning material by a cement, it will be understood that I may use other means such as by sewing the cleaning material to the backing. Also, if the cleaning material is sufficiently stiff, such as would be the case if a heavy felt were used, it would not be necessary to secure the bottom of the V shaped channel to the cleaning material.

In Fig. 2 is illustrated a cross section of a modified form of backing in which the sides 2 of the U shaped member are closed and the bottom of the channel is formed in the shape of a tubular passage 14 with slots 7 cut crosswise therein. In this type of backing the cement is forced through the end of the tubular portion 14 and caused to flow through the openings 7 and to make adhesive contact with the cleaning material. If desired the sides 2 of the U shaped member may be spread to form a V shaped channel as illustrated in Fig. 1, or, they may be left closed, depending upon the type of cleaning element desired.

In Fig. 3 I illustrate the use of the cleaning device as a mop. The V shaped channel member of the cleaning device is attached by any suitable means to a mop head 10 which is provided with a handle 11. In normal use the handle is held at an angle of about 45 degrees with the floor. In the spreading of the walls of the U shaped channel to form a V shaped channel as illustrated in Fig. 1, the angle between the bearing or scrubbing surfaces 12 and 13 will become less than 270 degrees, which, when the handle is held at an angle of about 45 degrees with the floor will cause the heel portion of the cleaning element to first make contact with the floor. In pushing the mop forward on the floor, a forward and downward pressure is applied which causes the heel portion of the cleaning element to be compressed before the toe portion, thus reducing wear at the toe. The dotted line 9 in Fig. 3 illustrates the normal position of the heel portion before compression. The full lines illustrates the compression of the heel portion when the mop is pressed against the floor F. Since the heel portion of the cleaning element is considerably thicker than the toe portion, and further since the heel portion is compressed more than the toe portion in cleaning operations, the heel portion will take most of the

wear, which is as it should be in this type of mop.

In use, when one bearing or scrubbing surface has become dirty, the mop may be turned over and the other surface used. When both surfaces are dirty, the cleaning element may be cleaned by passing water through the pores of the cleaning element, or, the cleaning device may be removed from the mop head and boiled. When cellulose sponge is used as the cleaning element, it is very desirable that the sponge be boiled at least once a week to increase the life of the sponge.

The cleaning device may be used for many purposes, and modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A cleaning device comprising an elongated block of compressible cleaning material normally substantially square shape in cross section, a slit formed lengthwise in one corner of said block, a channel shaped core member between the walls of said slit, the edges of said channel shaped member clamping around the edges of the slitted portion of said block.

2. A cleaning device comprising an elongated block of compressible cleaning material originally square shape in cross section, a slit formed lengthwise in one corner of said block, a channel shaped member between the walls of said slit, flanged edges on said channel member clamping the slitted edges of said block, and means attaching the bottom of the channel to the central portion of the cleaning material.

3. A cleaning device comprising an elongated block of compressible cleaning material originally substantially square shape in cross section, a slit formed lengthwise in one corner of said block, a channel member V shaped in cross section between the walls of said slit, outwardly and downwardly flared edges formed on said channel member securely clamping the slitted edges of the cleaning material, the bottom portions of said channel member being perforated, and adhesive means extending through the perforations in the bottom portion of the V shaped channel securing it to the longitudinal central portion of the cleaning material.

4. A cleaning device mounting means wherein the cleaning device comprises an elongated body of soft, pliable cellulose sponge material, said mounting means comprising an elongated slot in said elongated body, an elongated core member extending from at least the surface of said body into said slot, said elongated core member comprising an angle member, the angle of said member being inserted into said slot, pressing the walls thereof apart, the edges of said angle member extending beyond the plane of adjacent surfaces a distance less than the width of said adjacent surfaces and less than the width of said slot and folded over against said surface, back against said angle member and clamping the material of the body therebetween.

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The above entitled patent was extended October 2, 1951, under the provisions of the Act of June 30, 1950, for 7 years and 173 days from the expiration of the original term thereof.

Commissioner of Patents.