

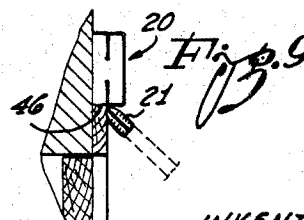
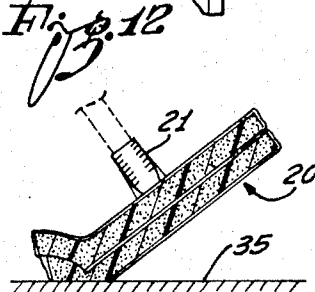
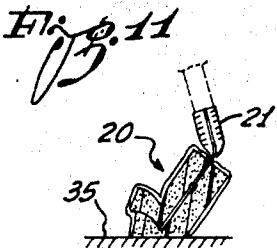
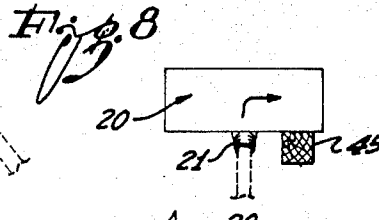
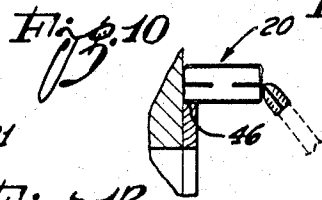
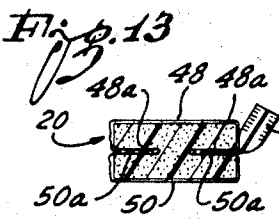
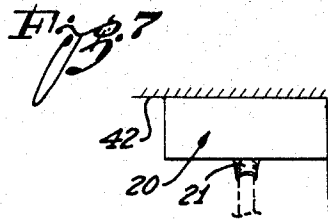
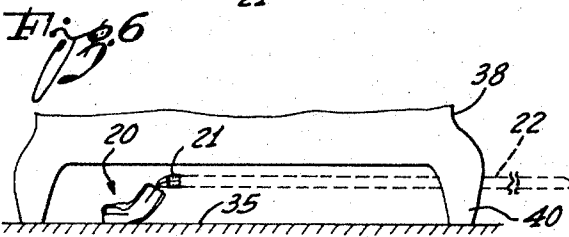
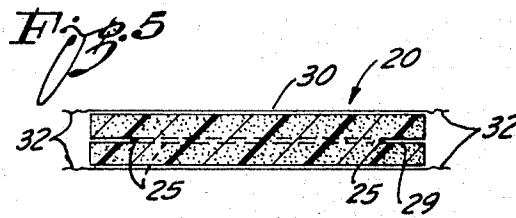
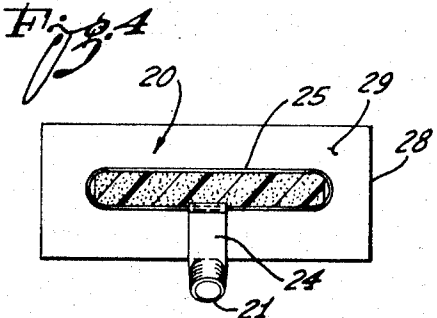
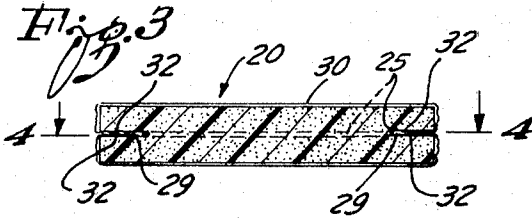
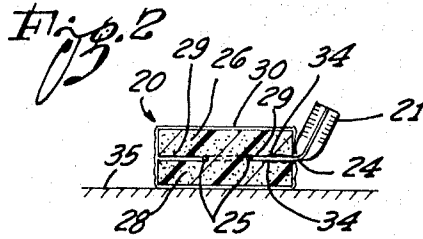
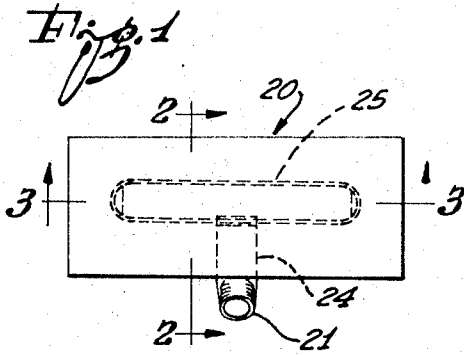
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DRY. MOP

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## ABSTRACT OF THE DISCLOSURE

A long handle terminates in a rigid web at an acute angle relative thereto and a rigid loop that is rigidly connected to the web is removably embedded in a rectangular block of foamed plastic material that has a slit extending continuously around its four sides. A chemically treated nonwoven fibrous plastic cleaning sheet encloses the block with margins of the sheet removably tucked into the slit on one side of the block to hold the sheet in place. Marginal portions of the block on all four sides of the block extend beyond the rigid loop and are free to bend when required for effective contact with surfaces that are to be cleaned.

### *Background of the invention*

It is old in the art to provide a dust mop wherein foamed plastic material is mounted on one end of a handle and a sheet of cleaning material such as paper toweling extends over a surface of the foamed plastic to be yieldingly pressed by the foamed plastic against a floor surface that is to be cleaned. In general, such devices are specialized for particular cleaning operations, for example, most such devices are intended to be used solely for cleaning a floor surface and normally rest flat against such a floor surface.

The present invention is directed to the need for a more versatile cleaning device that may be used in widely different ways to meet different problems in household cleaning operations. In many instances, such problems arise because some surfaces that should be cleaned in a room in a home are not readily accessible by a conventional dust mop and, therefore, are frequently neglected. As examples; it is a problem to clean or dust a baseboard at a corner of a room— it is a problem to clean or dust an overhead ledge such as a ledge over a doorway; it is a problem to clean or dust a relatively inaccessible rear surface of a table leg; and it is a problem to clean or dust a floor surface under a piece of furniture that has relatively short legs providing limited vertical clearance for access to the floor surface.

In other instances the problem is to provide a local intensified cleaning action on a floor surface, surfaces where merely increasing the pressure of an extensive portion of the mop flat against the floor is inadequate. For example, where an extensive flat surface of a mop is used to clean a floor surface a spot of tenacious clinging foreign material may be encountered that does not respond to merely increasing the pressure of the whole mop against the floor.

Another problem is to avoid excessive accumulative soiling of the foamed plastic material that is employed to press the cleaning sheet against a surface that is to be cleaned. In the usual mop structure, extensive areas of the foamed plastic are exposed, the exposed surfaces becoming progressively clogged with dust and other foreign particles. Whenever the mop makes impact against an object or wall, some of the particles that clog the foamed plastic are jarred loose.

Finally, problems relating to the outer cleaning sheet are, first, to provide such a sheet that is an efficient cleaning medium, second, to provide a cleaning sheet that

has a relatively long service life, and third, to insure that the cleaning sheet is smoothly mounted on the foamed plastic in a manner to resist slippage relative to the foamed plastic.

### *Summary of the invention*

In the preferred embodiment of the invention, a relatively long handle terminates in a rigid web at an acute angle to the handle and a rigid oblong loop made of heavy wire has its longitudinal axis positioned crosswise of the handle with one longitudinal side of the rigid loop centrally rigidly attached to the web to make the loop rigid relative to the handle. A relatively thick upper rectangular layer of resilient foamed plastic overlies the rigid loop and a similar coextensive lower layer of the foamed plastic underlies the loop, the two layers being united with each other over the area defined by the inside dimensions of the loop. Thus the two layers of foamed plastic constitute a unitary block of foamed plastic with the rigid loop embedded in the block. Since such a block of resilient plastic is readily compressible and deformable, it is a simple matter to distort the material of the block as required for assembling the block to the rigid loop or for removing the block from the loop.

The two coextensive layers of foamed plastic have marginal portions extending substantially beyond the rigid loop on all four sides of the loop thereby forming a slit that extends continuously around the four sides of the block with the above mentioned web extending into the slit on one side of the block. With the web in substantially the same plane as the rigid loop, the web conforms to the unrestrained configuration of the slit and thus avoids holding the slit open. Cleaning sheet material encloses the block with edges of the sheet material tucked into the slit to hold the sheet material in place.

In the presently preferred embodiment of the invention, the marginal portions of the two foamed plastic layers that form the continuous slit around the four sides of the foamed plastic block are of liberal width, being nearly as wide as the width of the rigid loop. Within the area of the rigid loop, the rigid loop effectively resists bending of the foamed plastic block, but marginal portions of the two coextensive foamed plastic layers lie outside of the loop configuration, these marginal portions forming the continuous slit around the block. In the present embodiment of the invention, the marginal portions of the two layers are of liberal width, being at least nearly as wide as the width of the rigid loop. Thus substantial portions of the foamed plastic block extend beyond the rigid loop in all four directions and are free to bend relative to the plane of the loop to lie against any surfaces to be cleaned that are at acute angles to the plane of the rigid loop.

The formed plastic block may be described as having a flat bottom surface, a flat top surface, a forward vertical nose surface, two opposite vertical side surfaces, and a rear vertical heel surface, all of these surfaces being covered with the cleaning sheet material. The versatility of the dry mop may be understood for different cleaning operations described hereafter.

A feature of the invention is that whenever desired, a substantially higher than the usual pressure per square inch may be applied locally to a floor surface to create a high degree of friction to dislodge a spot of foreign material that tends to cling tenaciously to the floor surface. Thus, when the dry mop is being used flat against a floor in the conventional manner, the dry mop may be tilted to tilt the metal loop relative to the floor so that one edge of the metal loop locally compresses the foamed plastic material against the floor surface.

A feature of the invention is the discovery that using a chemically treated sheet of a particular character solves the three previously mentioned problems relating to the

cleaning sheet. A cleaning sheet for this purpose may be a nonwoven sheet of a suitable plastic such as nylon. The sheet should be treated with a cleaning agent that is mildly adhesive with respect to dust. In other words, dust should tend to cling to the sheet but not with such tenacity as to prevent removal of the dust from the sheet by a brush. Such a sheet readily picks up and retains dust and foreign material and when the sheet is unduly soiled, the cleaning capability of the sheet may be readily restored by simply brushing the dust and foreign particles from the surface of the sheet. This capability of renewal results in the sheet having a relatively long service life.

It has been found that a cleaning sheet that is suitable for this purpose is manufactured by Chicopee Mfg. Co., New Brunswick, N.J., and is designated Masslinn Brand Cleaning Cloth No. 750. With reference to the problem of securing such a sheet to the foamed plastic block effectively and in a manner to resist slippage, it has been discovered that this particular impregnated cleaning sheet in effect engages the edges of the open cells at the surface of the foamed plastic material. Thus when an end portion of the sheet is tucked into the slit of the foamed plastic block the tucked in end portion is more effectively anchored than would be the case with plain paper towel-ing. In addition, the outer exposed portion of the sheet engages the edges of the open cells of the outer surface of the foamed plastic to resist any tendency of the sheet to slip relative to the foamed plastic surface. Thus effective anchorage of the sheet to the foamed plastic block does not depend solely on the anchorage of end edges of the sheet material in the continuous slit of the block and the sheet stays in place smoothly throughout a vigorous cleaning operation.

The features and advantages of the invention may be understood from the following detailed description and the accompanying drawings.

#### *Brief description of the drawings*

In the drawings, which are to be regarded as merely illustrative:

FIG. 1 is a plan view of the dry mop head with the handle removed;

FIG. 2 is a vertical section taken along the line 2—2 of FIG. 1;

FIG. 3 is a vertical section taken along the line 3—3 of FIG. 1;

FIG. 4 is a horizontal section taken as indicated by the line 4—4 of FIG. 3;

FIG. 5 is a view similar to FIG. 3 showing how, if desired, opposite marginal edges of the cleaning sheet may extend laterally beyond both sides of the foamed plastic block;

FIG. 6 is an elevational view showing how the mop in upside down position may be used to clean a floor surface under a piece of furniture where vertical clearance is limited, the normally top surface of the mop head being in contact with the floor surface;

FIG. 7 is a plan view showing how the front vertical toe surface and a vertical side surface of the mop head may be used to clean a baseboard at a corner of the room;

FIG. 8 is a plan view showing how the rear vertical heel surface of the mop head may be used to clean the rear surface of a table leg;

FIG. 9 is an elevational view showing how the rear vertical heel surface may be used to clean a ledge over a doorway;

FIG. 10 is an elevational view showing how the head of the dry mop may be turned upside down to clean the ledge over the doorway;

FIG. 11 is a sectional view showing how the dry mop may be tilted forward for the application of high unit cleaning pressure against a spot on the floor;

FIG. 12 is a similar view showing how the mop head may be tilted laterally for the same purpose; and

FIG. 13 is a cross sectional view showing how the

foamed plastic block may be encased by two separate cleaning sheets instead of a single cleaning sheet.

#### *Description of the preferred embodiment*

Referring to FIGS. 1 to 4 that show a mop head, generally designated 20, a metal socket 21 shaped for rigid screw engagement with a wooden handle 22 (FIG. 6) has a rigid extension in the form of a metal web 24 at an acute angle to the socket. The metal web, in turn, is rigidly secured to one of the longitudinal sides of a metal loop 25 which may be made of relatively rigid heavy wire. The mop head 20 comprises an upper relatively thick rectangular layer 26 of foamed plastic and a similar lower coextensive layer 28 of the foamed plastic, the two layers being integral or being united with each other, for example cemented together, within the area defined by the inner dimensions of the metal loop 25. It is to be noted that the area defined by the metal loop 25 is substantially smaller than the area of the foamed plastic material so that marginal portions of the two layers extend a substantial distance beyond the metal loop on all four sides of the mop head. Thus FIG. 2 shows how marginal portions of the two foamed plastic layers extend forwardly and rearwardly from the metal loop 25 and FIG. 3 shows how marginal portions of the two layers extend beyond each end of the metal loop. In the preferred practice of the invention, the width of each of these four marginal portions is at least nearly the width of the metal loop 25. The marginal portions of the two layers that extend beyond the loop may be greater than one inch in width. The two layers of foamed plastic may be approximately  $\frac{3}{4}$ " thick.

It is apparent that the two plastic layers 26 and 28 being centrally united, constitute a single block of the foamed plastic, the block having a relatively wide slit 29 extending continuously around its four sides. Thus the metal loop 25 is in effect embedded in the foamed plastic block, but since the foamed plastic is resilient and readily compressed and distorted, it is a simple matter to deform the block to whatever extent is necessary for the purpose of assembling the block to the metal loop or for the purpose of removing the block if desired.

In the preferred embodiment of the invention, the foamed plastic block is covered by the previously mentioned fibrous nonwoven plastic sheet 30 that is impregnated with a cleaning substance that is at least slightly adherent both with respect to dust particles and with respect to the surface of the foamed plastic block. In the construction shown in FIGS. 1 to 5, a single cleaning sheet 30 is employed that is of a width indicated in FIG. 5, the width providing opposite side margins 32 of the cleaning sheet that overhang the opposite sides of the block.

As indicated in FIG. 2, the opposite ends 34 of the cleaning sheet 30 are tucked into the continuous slit 29 of the foamed plastic block on the rear or heel side of the block, one tucked-in end overlying the metal web 24 and the other tucked-in end underlying the metal web. It is to be noted in FIG. 2 that the metal web 24 is in the same plane as the metal loop 25 that extends outward beyond the heel of the mop head 20 so that the metal web does not tend to open up the slit 29. In applying the cleaning sheet to the block, one of the ends of the sheet is tucked into the slit at the heel of the block and then the sheet is wrapped smoothly and snugly around the block before the second end is tucked into the same place in the slit. Since the chemical cleaning substance with which the cleaning sheet 30 is impregnated is at least slightly adherent with respect to the plastic block, the cleaning sheet tends to cling to the plastic block and be smoothly held against the block.

The substance with which the cleaning sheet is impregnated is sufficiently adherent with respect to dust particles to collect the dust particles but nevertheless does not hold the dust particles so tenaciously as to prevent removal of the dust particles by a brush. Thus the dust-collecting ca-

pability of the cleaning cloth may be periodically restored to give the cleaning cloth a relatively long service life.

If desired, the side margins 32 may be left extending outwardly as shown in FIG. 5, but preferably the side margins 32 are tucked into the slit 29 on the opposite sides of the foamed plastic block as indicated in FIG. 4. Thus in the preferred embodiment of the invention no part of the foamed plastic block is left exposed to become soiled with dust particles and other foreign matter.

FIG. 2 shows how a dry mop may be employed on a floor surface 35 in the conventional manner. FIG. 6 shows how the mop head 20 may be turned upside down and with the handle 22 horizontal or nearly horizontal the mop head may be used to clean a floor surface 35 under a piece of furniture 38 that has relatively short legs 40 to limit the vertical dimension of the space above the floor surface. With the mop head 20 turned upside down, the normally top surface of the mop head is flexed and flattened against the floor surface.

FIG. 7 shows how the dry mop may be employed to clean the vertical surfaces of a baseboard 42 at a corner of the room. In this operation of cleaning vertical surfaces of the mop head, namely the forward vertical toe surface and the two side vertical surfaces of the mop are employed.

FIG. 8 shows how the head of the mop may be maneuvered as indicated by the angular arrow 44 to clean the back surface of a table leg 45. In this cleaning operation it is the vertical surface of the heel or rear side of the mop head that is employed.

FIGS. 9 and 10 show how the dry mop may be employed to clean a ledge 46 above a doorway. In FIG. 9, it is the heel of the mop head that carries out the cleaning operation whereas in FIG. 10 where the mop head is upside down, it is the forward margin of the normally top surface of the mop head that cleans the ledge.

FIG. 11 shows how when the mop head is being used to clean a floor surface 35 in the manner indicated in FIG. 2 the handle may be temporarily swung forward to tilt the metal loop 25 forward for the purpose of compressing a narrow portion of the lower layer of the foamed plastic against the floor surface 35 for creation of local high unit pressure to generate highly effective friction for dislodging a spot of tenacious foreign material. It is to be noted that by virtue of the extensive portions of the distorted mop head that extend rearward and forward from the lower edge of the metal loop, there are ample areas of the cleaning cloth available to pick up the particles that are dislodged. It is to be noted that in FIG. 6 the metal loop is inclined in the same way so that added pressure on the mop head by the handle 22 will cause the same local rise in pressure against the floor surface.

FIG. 12 shows how the mop head may be inclined laterally in one direction or the other to cause one end of the metal loop 25 to create local high pressure in the manner heretofore described.

FIG. 13 shows how two separate cleaning sheets 48 and 50 may be used to encase the plastic block, each of the sheets being of the width heretofore specified. The top sheet 48 extends over the top surface of the block with the two opposite ends 48a of the sheet tucked into the slit 29 on the forward and rearward sides respectively of the mop head. In like manner, the second cleaning sheet 50 extends under the block with its opposite ends 50a tucked into the slit on the forward and rearward sides of the mop head.

My description in specific detail of the preferred embodiment of the invention will suggest various changes, substitutions, and other departures from my disclosure within the spirit and scope of the appended claims.

I claim:

1. A device of the character described for applying cleaning action to various surfaces in a room having furniture, comprising:

a relatively long handle terminating in a rigid oblong

loop rigidly attached to the handle in a plane at an acute angle to the handle, said loop having its longitudinal axis transversely of the vertical plane of the inclined handle;

a rectangular layer of resilient foamed plastic several times the thickness of the loop overlying the loop and a similar foamed plastic layer underlying the loop, the two layers being united with each other over the area defined by the inner dimensions of the loop whereby the two layers constitute a block of foamed plastic with the loop embedded in the block, the two layers having marginal portions extending beyond the loop on all four sides of the loop thereby forming a slit extending continuously around the four sides of the block with said web extending through the slit on one side of the block; and

flexible cleaning sheet material enclosing the block with edges of the sheet tucked into the slit,

said marginal portions of the foamed plastic layers being at least as wide as the width of the rigid loop whereby the rigid loop directly reinforces a central zone of the block against forces that tend to bend the block relative to the plane of the loop,

said marginal portions of the foamed plastic layers having freedom to bend relative to the plane of the rigid loop to enable the sheet to lie flat against surfaces to be cleaned that are at acute angles to the plane of the loop,

whereby with the bottom of the block lying flat on a floor surface, the inclined handle may be swung upward to tilt the rigid loop forward relative to the floor to cause the longitudinal edge of the rigid loop remote from the handle to locally compress the bottom layer of foamed plastic for relatively high unit cleaning pressure locally against the floor,

whereby with the bottom of the block lying flat on a floor surface, the handle may be manipulated to tilt the loop laterally relative to the floor surface to cause one end of the loop to locally compress the lower layer of the foamed plastic for local relatively high unit cleaning pressure against the floor, and

whereby with the handle extending nearly horizontally under a piece of furniture with the block reversed to place the normally upper surface of the block against the floor surface under the furniture, a substantial portion of the width of the block will be flexed into flat contact with the floor surface with the longitudinal edge of the loop remote from the handle locally compressing the normally upper layer of the foamed plastic against the floor surface for local relatively high unit cleaning pressure against the floor surface.

2. A combination as set forth in claim 1 in which said cleaning sheet comprises an unwoven fibrous plastic sheet impregnated with a cleaning substance.

3. A combination as set forth in claim 2 in which the cleaning substance is at least lightly adherent with respect to dust but is only lightly adherent to permit accumulated dust to be brushed away from the cleaning sheet for renewal of the usefulness of the cleaning sheet.

4. A combination as set forth in claim 3 in which the sheet material interlocks with the edges of the open cells of the surface of the foamed plastic to resist slippage relative to the foamed plastic to a greater degree than sheet material of conventional paper towels.

5. A combination as set forth in claim 4 in which the foamed plastic is polyurethane.

6. A combination as set forth in claim 1 in which said sheet is substantially wider than said block with opposite side margins of the sheet extending beyond opposite side edges of the block.

7. A combination as set forth in claim 1 in which said sheet is wider than the block with opposite side margins of the sheet at the opposite sides of the block; and in which said side margins of the sheet are tucked into said slit at the opposite sides of the block

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whereby the sheet covers all of the outer surfaces of the block.

8. A combination as set forth in claim 1 in which said layers of foamed plastic are approximately  $\frac{3}{4}$ " thick and in which said marginal portions of the two layers that extend beyond the loop on all four sides of the loop are more than 1" in width.

9. A combination as set forth in claim 1 in which the handle is connected to the rigid metal loop by a rigid metal web that extends into the loop.

10. A combination as set forth in claim 1 in which said flexible cleaning sheet material is a single sheet extending over the top, forward, bottom and rearward surfaces of the block with the two ends of the sheet tucked into said slit at the rear of the block.

11. A combination as set forth in claim 1 in which the cleaning sheet material comprises two flexible sheets enclosing the block, one of the sheets extending over the top surface of the block with opposite ends of the sheet tucked into the slit on the forward and rearward sides of the block, the other sheet extending under the block with the opposite ends of the sheet also tucked into the slit on the forward and rearward sides of the block, and

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said cleaning sheets being unwoven fibrous plastic sheets impregnated with a substance that is at least lightly adherent with respect to dust particles.

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