United States Patent [19]

Oishi

[11] **3,908,218**

[45] **Sept. 30, 1975**

[54] **CLEANING PAD**

[76] Inventor: **Kazuko Oishi,** 2308 W. Victoria Ave., Montebello, Calif. 90640

[22] Filed: **Jan. 4, 1974**

[21] Appl. No.: **430,714**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 278,006, Aug. 4, 1972, abandoned.

[52] **U.S. Cl.** ..... **15/209 R**

[51] **Int. Cl.²** **A47L 17/08**

[58] **Field of Search** ..... 15/208, 209 R, 209 A, 15/209 AH, 244 B, 244 C, 118, 210 R, 104.93; 401/201

[56] **References Cited**

UNITED STATES PATENTS

1,773,734	8/1930	Kean	15/209 A
1,873,503	8/1932	Stewart	15/209 R
2,948,911	8/1960	Steiner	15/209 AH
3,216,028	11/1965	Lawson	5/337
3,343,196	9/1967	Barnhouse	15/209 R
3,711,889	1/1973	Jennings	15/227

FOREIGN PATENTS OR APPLICATIONS

1,070,031	2/1954	France	15/244 B
414,099	5/1925	Germany	15/209 A
822,467	9/1937	France	15/209 AH
398,337	9/1933	United Kingdom	15/209 A

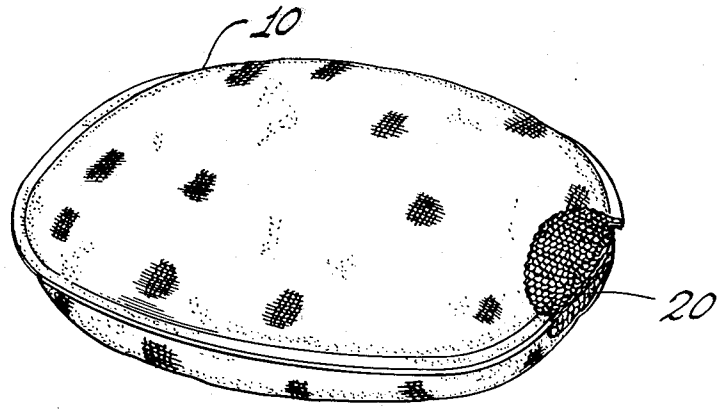
Primary Examiner—Daniel Blum

Attorney, Agent, or Firm—Forrest J. Lilly

[57] **ABSTRACT**

A cleansing pad made of a special nylon basket-weave type of fabric bag, filled with a resilient pad composed of nylon net, and which is incapable of retaining any material quantity of water.

6 Claims, 18 Drawing Figures



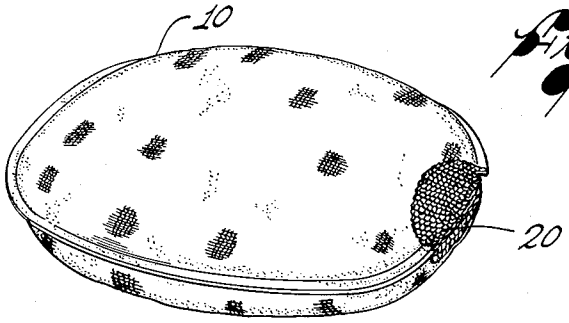


Fig. 1

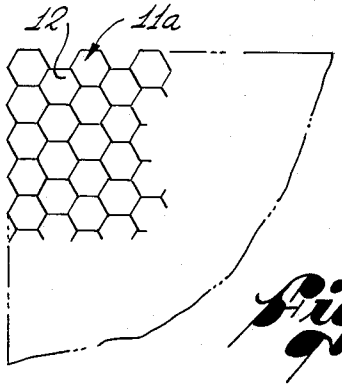


Fig. 2

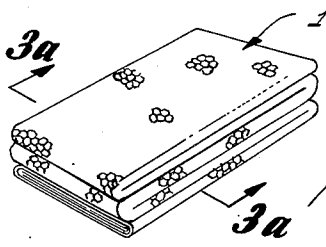


Fig. 3

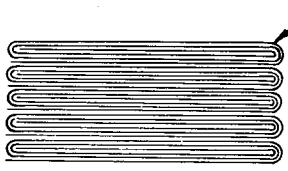
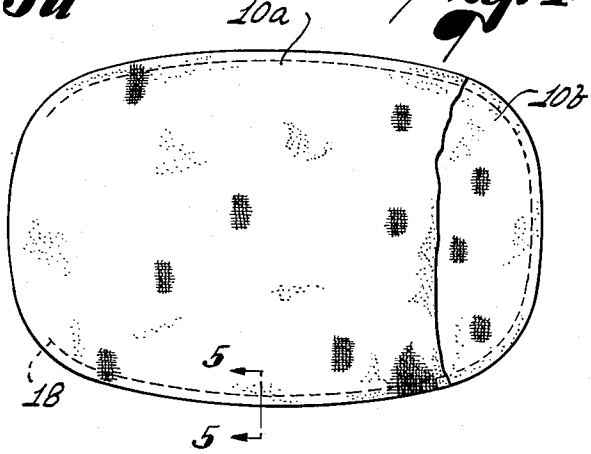


Fig. 3a

Fig. 4



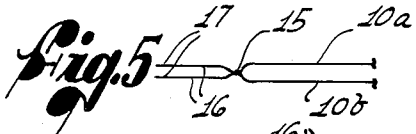


Fig. 5



Fig. 6

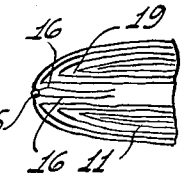


Fig. 7

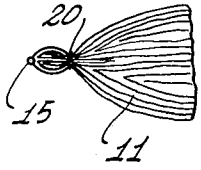


Fig. 8

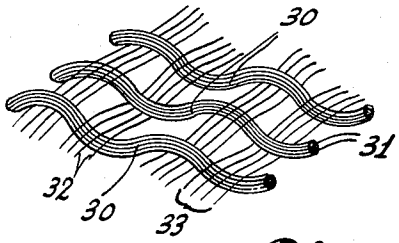


Fig. 9

Fig. 11

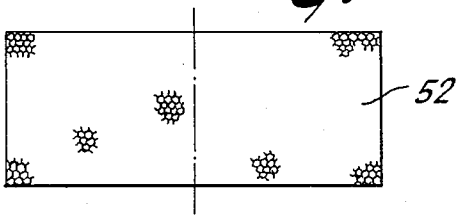
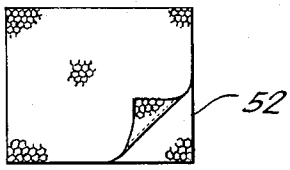


Fig. 12



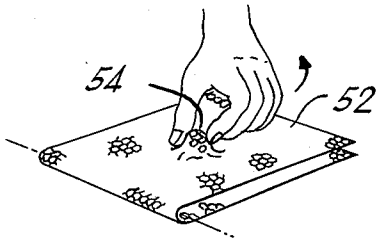


Fig. 13

Fig. 14

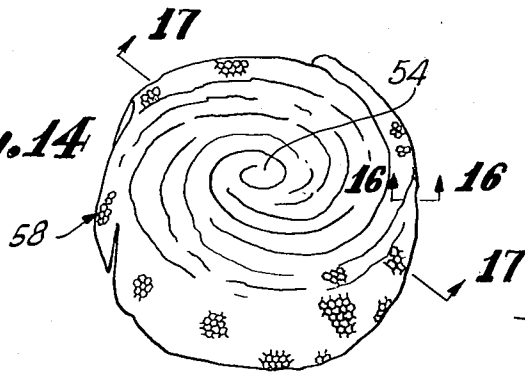


Fig. 15

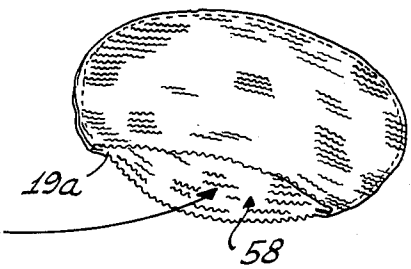
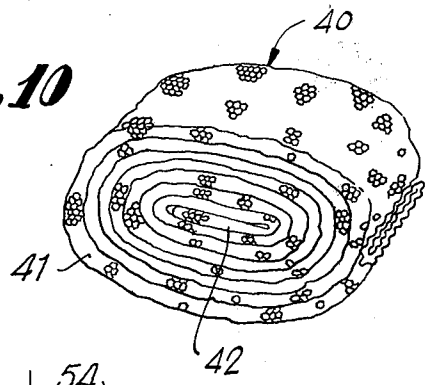


Fig. 10



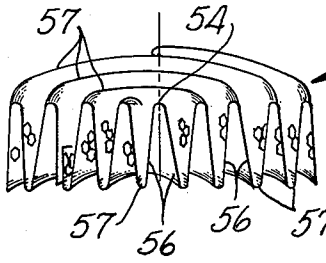


Fig. 17

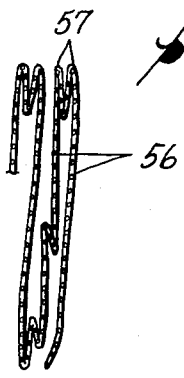


Fig. 16

CLEANING PAD

RELATED APPLICATIONS

This is a continuation-in-part of my earlier co-pending application Ser. No. **278,006,** filed Aug. **4, 1972,** entitled Cleaning Pad now abandoned.

FIELD OF THE INVENTION

This invention relates generally to scouring or cleaning pads, of the type having an outer mesh bag of a durable roughsurfaced plastics texitle material, and a porous filler.

BACKGROUND OF THE INVENTION

Scouring pads of the type referred to herein are generally filled with some spongy, water-holding material, often foam rubber. Such a pad is used by dipping it in water, and then scouring the article to be cleaned, with or without the use of cleansing powders. A primary shortcoming of such pads as have been known in the past is that the sponge filler tends to retain a substantial quantity of water, even after squeezing, and such water, generally retaining some food substances, or dirt, in a very short time acquires an unpleasant odor.

A general purpose of this present invention is accordingly to provide such a bag with an inner filler substance which retains hardly any water, i.e., an insufficient amount to generate a noticeable odor, and which by the same token remains clean and sanitary over a long period of time.

A further purpose of the invention is to provide a scouring pad of the character described with a cover of textile material that has a substantial degree of elastic stretch in at least one direction, whereby to afford a good, taut fit of the cover over the filler.

A still further purpose is to provide an open-work filler, of a resilient nylon net material, so contrived as to be resiliently self-biased to an expanded condition, both to fill the bag fully and smoothly, and also to a condition of maximized "openness," whereby it will hold almost no water, while the spaces between the filaments of the net are spread apart to maximize quick drying.

BRIEF DESCRIPTION OF THE INVENTION

The scouring pad according to the invention in its most preferred form, comprises a plastics cover material, preferably nylon, of a weave affording a limited degree of resilient or elastic stretch in a direction preferably laterally of the pad, and a filler material comprised of multiple layers of an openwork, resilient or springy material. A preferred material is nylon net or equivalent plastics substance, of a relatively large open-work pattern. The elastic stretch cover or bag material is neatly filled by the resilient filler. The nylon textile cover, or bag, is tough, durable, resilient, and hard enough to effectively scour away food materials from dishes, silverware, or metal pans, or dirt or scum from bowls, bath tubs, etc. without scratching.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the scrubbing pad of the invention;

FIG. **2** is a view showing a sheet of the filler pad material in plain view;

FIG. **3** is a perspective view showing the filler pad folded from the material of FIG. **2,** prior to insertion into the cover bag;

FIG. **3***a* is a view taken on line **3a-3a** on FIG. **3**;

FIG. **4** is a plan view showing the two halves of the cover bag in plan, after stitching together and before turning inside out;

FIG. **5** is a detail section on line **5-5** of FIG. **4**;

FIG. **6** is a section similar to FIG. **5** but after turning inside out;

FIG. **7** is a similar view, but after stuffing with the filler bag;

FIG. **8** is a view similar to FIG. **7,** but after a final stitching;

FIG. **9** is a perspective view to an exaggerated scale showing the textile preferably used for the outside cover;

FIG. **10** is a perspective view of an alternative filler in accordance with the invention;

FIG. **11** shows a strip of nylon net from which another embodiment of the filler of the invention can be formed;

FIG. **12** shows the sheet of FIG. **11** doubled over;

FIG. **13** shows the next step following that of FIG. **12**;

FIG. **14** shows rather diagrammatically and pictorially the filler at the conclusion of the step of FIG. **13**;

FIG. **15** shows the step immediately following that of FIG. **14,** with the filler being substantially stuffed inside the enclosure bag of the invention;

FIG. **16** is a section, generally diagrammatic, taken in accordance with linc **16—16** of FIG. **14**; and

FIG. **17** is a diagrammatic view taken on line **17—17** in FIG. **14,** with radial spreading of spiral folds for clarity of understanding.

DETAILED DESCRIPTION OF AN ILLUSTRATIVE EMBODIMENT

The scouring pad of the invention comprises a nylon or other suitable plastics textile cover or bag **10,** woven somewhat loosely of nylon or similar hydrophobic plastics filaments, and a porous, resilient, non-absorbing filler pad or flattened ball **11,** comprised of many layers of nylon net. The expression nylon is herein used in its generic sense to denote a plastics filter substance which is relatively hard, smooth surfaced, resilient, hydrophobic and non-wearing, which, particularly when wet, is non-absorptive, but slides over a soiled surface to be cleaned in a semi-slippery manner, and which readily and rapidly cuts away dirt and scum, or food accretions or the like, but is not hard or abrasive enough to scratch or mar dishes, silverware, stainless steel pans, porcelain bowls or the like. Any equivalent is of course within the meaning of the word nylon as used herein and in the claims.

The filler has water absorption characteristics almost the opposite of a sponge. It comprises a pad made up of multiple layers **11**a of nylon net or other equivalent plastics textile, and preferably having the physical characteristic of single, relatively stiff and resilient filaments **12** of the plastics material in an openwork pattern, e.g., preferably forming a multiple openwork hexagon pattern, as in FIG. **2.** The scale in FIG. **2** is about **1.5** to **1,** and the filaments defining the hexagons are quite fine, as in the generally familiar commercial product. This material is light, stiff and quite resilient, as well as very porous to water. But it does not hold water. A stream of water will run through a large number

of successive layers of the material with scarcely any restraint. The individual filaments making up each hexagon are resiliently bendable, but relatively stiff. Any lateral bending of the material is quite strongly self-resisted, and develops a corresponding return force. The filler is thus "springy."

Preferably, for a bag about 4¼ inches long and 3½ inches wide, I may use for the filler a rectangular strip of the nylon net which is initially about **12** times wider than the pad, and about **15** times longer. For example, it may be about 3½ feet wide and **5** feet long, and may initially be in the general form of a rectangle. This is not to say that the strip of nylon net to be used cannot be cut off on a diagonal at its end or ends, or otherwise depart from a true rectangular shape, but an original rectangular shape facilitates, in some forms of the pad, the folding or winding manipulations necessary to produce the pad, which, in the form of FIGS. **1–9,** is substantially or generally rectangular.

To produce the pad, in one of its forms, I fold the nylon net strip along longitudinal fold lines, spaced apart by approximately the width of the bag, six or seven times. I then fold the resulting elongated multilayer pad back and forth along transverse fold lines spaced apart by approximately the length of the bag, in a zig-zag pattern (FIG. **3**), so as to form a folded substantially rectangular pad as seen in FIG. **3.** The individual folds or layers of this pad, owing to the bends therein all along their multiple longitudinal and transverse uncreased edges, are self-biased, to expand resiliently to a pad thickness of say **2** inches, yet may be easily squeezed by the fingers to a compressed thickness of approximately ¼ inch. When so compressed, perpendicularly to the folds, there is a resilient deformation of the folds from their initial flat planes, and thus a springback force is developed.

The preferred textile weave of the outer cover is such as to have a substantial capability of lateral elastic stretch laterally of the bag (or longitudinally if preferred). There may be a small degree of longitudinal stretch as well, but the lateral stretch enables the outside cover to conform snugly to the filler, while the longitudinal stretch, if used, may help to a minor degree. Or these directions can be interchanged. The weave of the preferred cover is shown greatly magnified and exaggerated in FIG. **9** and will be described more fully hereinafter.

The cover **10** is in two identical upper and lower layers **10***a* and **10***b*, and these are trimmed, for example, to a rectangular, oir generally rectangular, rounded-corner or other equivalent shape, placed back to back (FIG. **4**) with their "wrong" or inside surfaces initially next to one another, and then stitched together as at **15,** leaving margins or hems **16** between the stitching and outmost edges **17** (FIG. **5**). The stitching **15** has a gap **18,** at one end (or along one side, as in FIG. **15**). The bag so formed is then turned inside-out (FIG. **6**). The folded nylon net filler pad is then inserted into the bag through the gap **18.** To introduce it readily, it may be resiliently compressed by the fingers, and then released after insertion, whereupon it expands resiliently and snugly fills the bag, the bag stretching slightly under the expansion force to take up the slack. It is positioned inside the bag so that one or more edge portions **19** of the net material of the pad work into the space alongside the aforementioned margins or hems **16.** The pad is then stiched along a stitch line **20,** inwardly of the outer periphery formed by the stitch line **15.** The stitch line **20** will be understood not only to form the bag with what is known commonly as a French seam, but to switch in place, to the strips **16,** edge portions **19** of the filler pad, all as suggested in FIGS. **7** and **8.**

Thus I form a nylon bag, stiched around the multilayered, or folded, nylon net filler pad, the cover having the elastic stretch characteristics, and the filler the elastic compression and expansion characteristics, to form a smooth, taut pad, wrinkle-free, and easily resiliently compressible into a form conforming to the contour of a surface to be cleaned.

The preferred material for the cover is shown somewhat diagrmmatically and to greatly exaggerated scale in FIG. **9.** This material, made of nylon or equivalent, is manufactured in Japan, and is on the market in the United States. It is referred to as "toweling," but, being non-absorbent, is not intended for drying but rather for washing or rinsing. This particular material has been found very effective for the present purpose, but of course other nylon or other suitable loosely woven plastics textile material of good scrubbing characteristics may be used. The illustrative textile is composed of parallel nylon multifilament strands **30,** each made up of six or eight nylon fibers or monofilaments **31.** The individual multifilament strands will be seen to have a sinuous or wavy form, and have been described herein as "generally sinusoidal." The pitch or "wave length" of the wave-like undulations of the strand is uniform, and the wave character may be termed generally sinusoidal notwithstanding that the basic wave form, speaking in strict mathematical terms, is not that of a single frequency sinusoid. Thus as used herein, the term generally sinusoidal implies and denoted a wave form of alternate peaks and valleys of substantially uniform peak amplitude, and of uniform wave length or pitch (distance from peak to peak). Strict conformation to a pure since curve is not, however, required; and within the meaning of generally sinusoidal as herein used, the wave form may even approach or become substantially a square wave (which actually results from a pure fundamental sine wave to which is added sine wave harmonics). The multifilament strands **30** may be very slightly kinky as well as being generally sinusoidal in form, and are spaced slightly apart, say half their diameter, as represented with considerable exaggeration, for clarity of illustration, in FIG. **9.** The strands **30** are thus capable of limited longitudinal stretch because of the waves or kinks therein, which straighten under tension. They are preferably oriented transversely of the pad. As will appear, peaks and valleys of successive strands **30** fall opposite one another, and afford the material a ribbed surface structure. Extending at right angles to and interwoven with the sinusoidal strands **30** are fine monofilaments **32.** Monofilaments **32** cross alternately under and then over successive peaks of the sinusoidal multifilament strands **30.** The monofilaments **32** of each group **33** are laterally spaced, and generally parallel to one another. However, they follow a somewhat zig-zag path as they cross over and then under the successive multifilament strands **30.** They are straight enough, however, that the woven textile has imperceptible stretch in the direction of the monofilaments **32.**

The zig-zag monofilaments **32** will be seen to hold the wavy multifilaments with the waves therein oriented into planes which are approximately, i.e., within **15°** or

so, of the perpendicular to the textile cover, so that the peaks thereof reach outward from the pad to engage the surface being cleaned during performance. The sinusoidal mutlifilament strands **30** are so arranged that their peaks and valleys are aligned in directions at right angles thereto, giving the textile a ribbed appearance and effect. These rib-forming strands of nylon, and especially the peak portions thereof, form parallel scrubbing elements which readily and effectively cut or shear away food, scum or dirt. Thus, when the pad is rubbed against a plate to be cleaned, for example, loops or peaks of the nylon multifilament strands can catch or snag food accretions on the plate and thus remove them.

The sinusoidal multifilaments **30** stand normally in a contracted condition. They are readily stretched to a degree, however, where necessary to accommodate the bulk and shape of the filler pad, or when in use.

The scrubbing pad as thus described is a most useful housefold cleaning device. When wetted, it slides easily over the surfaces of a dish with an actual slippery effect, contributing a good "feel" to the operation, while at the same time cutting away or abrading hardened food or dirt with surprising ease. The pad has great springiness, and resultant conformability to the shape of a dish when pressed thereagainst. Thus the pad, because of the springiness of the interior layers of nylon net material, self-conforms to the shape of a dish, spoon, fork, or knife, bathroom faucets, and the like, while the pad is moved thereover under light to moderate downward pressure. Thus more rapid removal of food, scum, etc., is gained.

In use, the pad is generally fully wetted, and then scrubbed over the surface to be cleaned. It will hold a certain quantity of water until pressured or squeezed, but its water-retaining property is very low. Simple squeezing after use, or even "flipping," results in virtually emptying it of water. A stream of water directed over the pad will run right through, removing dirt or food particles which may have gotten into the filler. Easy squeezing then clears out the water, and the pad rapidly dries throughout. Owing to this free water-emptying property, the pad stays clean and sweet for an unexpectedly long period of time.

Next, with reference to FIG. **10**, there will be described an alternative filler pad **40**, made again of resilient nylon net material and of a multilayer type, with folds or bends such as will again have the desirable spring character.

A strip of nylon net, again about ½ feet wide and **5** feet long, is folded first along longitudinal fold lines spaced apart by the width of the bag, as before. The resulting multiple layer strip **41** is then folded, not in zigzag fashion as before, but end-over-end, beginning with a fold length **42** only a small fraction of the length of the bag, and ending with a final fold length, when the roll is flattened (FIG. **10**), of substantially the length of the bag. It will be seen that this pad is simply rolled and then somewhat flattened, as distinguished from the zigzag arrangement first explained. It will be seen also that, as in the first form, the resulting pad has layers **43** in face-to-face contact, and interconnecting bends along the longitudinal edges of the layers which give it the spring character described in connection with FIGS. **1–4**. The pad of FIG. **4** is next encased in the bag as described for the first embodiment. The top and bottom **10a** and **11a** of the bag of FIGS. **1** and **4** may go onto the upper and lower halves of the filler as the latter is seen in FIG. **10**; or, as an alternative the two halves of the bag or cover could go onto the ends of the "rolled" filler of FIG. **10**.

Finally, FIGS. **11-17** show a presently preferred form of pad **50** which, again relying on the springiness of the resilient nylon net, when bent, has an inherent self-bias or spring return action which is even superior to the embodiments described above.

I again start with a strip **52** of resilient nylon net, of the earlier described hexagonal pattern, and of dimensions of about **2** feet by **5** feet (FIG. **11**). This piece is then folded over, giving a double thickness piece 2 feet × 2 ½ feet, with a fold along one edge (FIG. **12**). I then lift up the center of the double thickness piece, so there is a center hump, core, or "hub" **54**, which can be grasped by the fingers, as illustrated, and twisted, or gyrated, while the portions outside thereof are worked and folded into successive vertical folds **56**, in a manner as to cause the surrounding material to wind fairly tightly into a spiral roll **58** about this hub.

The manipulations are carried out properly if the doubled sheet (FIG. **13**) is laid over one hand (not shown), and, with the other, the hump **54** is lifted up say an inch or two, and then twisted around a number of times, accompanied preferably with a gyrating motion. Once the ball is well started, the supporting hand can be used to aid in arranging the folds, so they are principally or for the most part of a substantially uniform height, and wind on a spiral manner. The material thus tends to form into concentric folds or layers **56**, joined along bends **57**, in spiral patterns (FIGS. **14** and **17**), finally to form the spiral roll **58**, as seen in FIG. **14**. The roll is made fairly tight, and of a size which can just be introduced through the slit **19a** in the side of the bag (FIG. **15**). The roll goes in snugly, but then springs out both radially and circumferentially, so as to accommodate to the size and shape of the bag.

The radial expansion is of course owing to the fact that the roll has been fairly tightly made, and naturally expands considerably when released inside the bag. Also, of course, the bends at the longitudinal edges of successive layers of the roll tend toward expansion of the successive turns. The reason for the great springiness in the vertical direction (axially), is less obvious, but can be understood by considering FIG. **16**. If the pad is compressed, folds **56** are lessened in width (vertically), and hence must bend or wrinkle laterally, with perhaps several changes in direction in some cases. This is resilient deformation in directions perpendicular to the folds. In addition, the hexagonal openwork pattern tends to resiliently collapse vertically under vertically applied pressure when the folds **56** are compactly held in mutually supporting relationship by virtue of the tightness of the wind. This is resilient deformation transversely of the folds. Thus, considerable energy is stored in the "spring" constituted by the roll of resilient material. When the compressive force is removed, these bends and collapses tend to return to their original form, and very considerable return force is then available to expand the roll so that it returns to its initial thickness, and thus again supports the pad in a well filled and uniformly rounded condition. The filler in this form gives the pad added spring force to keep it well expanded. This form of filler also avoids any kind of lumpiness, or non-uniformity, and thus achieves a very commercially acceptable character.

Considering FIGS. **14, 16** and **17**, it will be appreciated that these illustrations have been somewhat idealized for purpose of clear illustration. Thus, in reality in FIG. **14**, the successive turns of the spirally wound filler are thinner, more numerous, and may not be quite so regular as pictured. Also, the folds **56** in FIGS. **16** and **17** are actually in mutual tight contact; and where two folds form a bend, where they join, the bends generally are somewhat open, so as to form loops. They exist, however, in a compact multi-layer state, and carry out effectively the functions assigned to them.

FIG. **15** shows the roll **58** of FIG. **14** following insertion into a bag, and prior to sewing up the entrance slit **19***a*.

Equivalents of the specific embodiments herein illustrated are intended to be within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A cleaning pad, comprising:

a bag composed of an exterior plastics textile, and a filler in said bag comprised of superimposed layers of open-work plastics material,

said exterior textile comprising interwoven plastics multifilament strands and monofilaments, the multifilament strands running side-by-side in one direction and comprising succesive slightly laterally spaced, generally parallel multifilament strands which are of generally sinusoidal form,

with the individual successive substantially sinusoidal multifilament strands forming alternate peaks and valleys of uniform lengths which are transversely aligned in directions perpendicular to said strands, and

said monofilaments including transversely spaced monofilaments running at right angles to, and alternately under and over, in a zig-zag manner, the successive aligned peaks and valleys of successive sinusoidal multifilament strands, all in an arrangement affording the plastics textile material with a ribbed surface structure, and also in one wherein the substantially sinusoidal multifilament strands are resiliently longitudinally stretchable in response to tension by straightening of said sinusoidal form.

2. A cleaning pad, comprising:

a porous bag composed of a plastics textile; and

a filler in said bag composed of a sheet of relatively stiff and resilient openwork, plastics net, folded a plurality of times each on parallel longitudinal fold lines spaced apart by substantially the width of the bag, and on parallel transverse fold lines at right angles to said longitudinal fold lines, in dimensions to fill said bag and in a manner affording a multiple-layer filling pad, with adjacent layers of the pad in facial contact, joined integrally along adjacent, uncreased edges thereof to afford bias forces tending to resiliently expand the pad and tauten the bag.

3. A cleaning pad, comprising:

an exterior bag composed of a loosely woven plastics textile material adapted for free passage of water therethrough,

a resilient filler snugly fitted into and at least slightly stretching said bag, composed of a sheet of openwork, relatively stiff and resilient plastics net arranged into a compact multilayered bag-conforming configuration including a succession of intimately facially contacting fold layers integrally joined at adjacent uncreased edges which resiliently resist compressive deformation of the layers at the marginal bends between fold layers and which resiliently bias said pad to expand within and tauten said bag.

4. The cleaning pad of claim **3**, wherein said filler comprises a sheet of the plastics net folded a plurality of times each on parallel longitudinal fold lines spaced apart by substantially the width of the bag, and also end over end a plurality of times on parallel transverse fold lines spaced apart initially by a distance substantially shorter than the length of the bag, and then by progressively increasing the distances to a final distance substantially the length of the bag.

5. The subject matter of claim **3**, wherein the filler is composed of a sheet of plastics net gathered at the center in an axial core, and with the remainder of said sheet arranged thereabout in a plurality of adjacent, concentric, spirally wrapped folds which form a roll conforming in width generally to the desired uncompressed thickness of the pad, and which are spirally wound tightly about said axial core.

6. The subject matter of claim **3**, wherein the plastics textile bag is at least limitedly stretchable in at least one direction.

* * * * *