

July 14, 1970

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3,520,401

DISPOSABLE SURGICAL SCRUB SPONGE DISPENSER

Filed Aug. 5, 1968

4 Sheets-Sheet 1

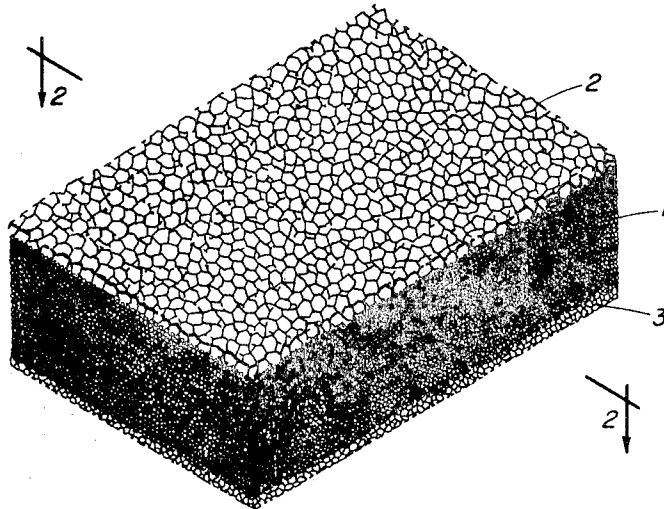


FIG - 1

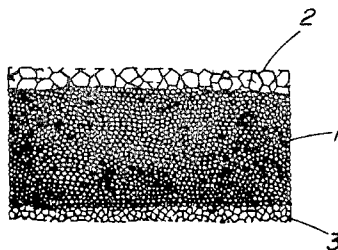


FIG - 2

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4 Sheets-Sheet 2

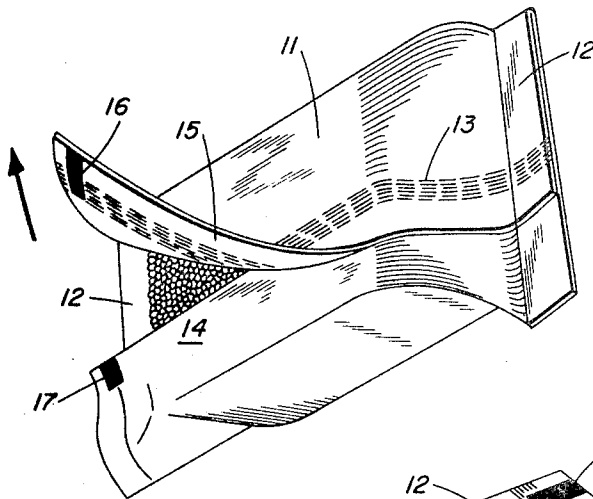


FIG-3

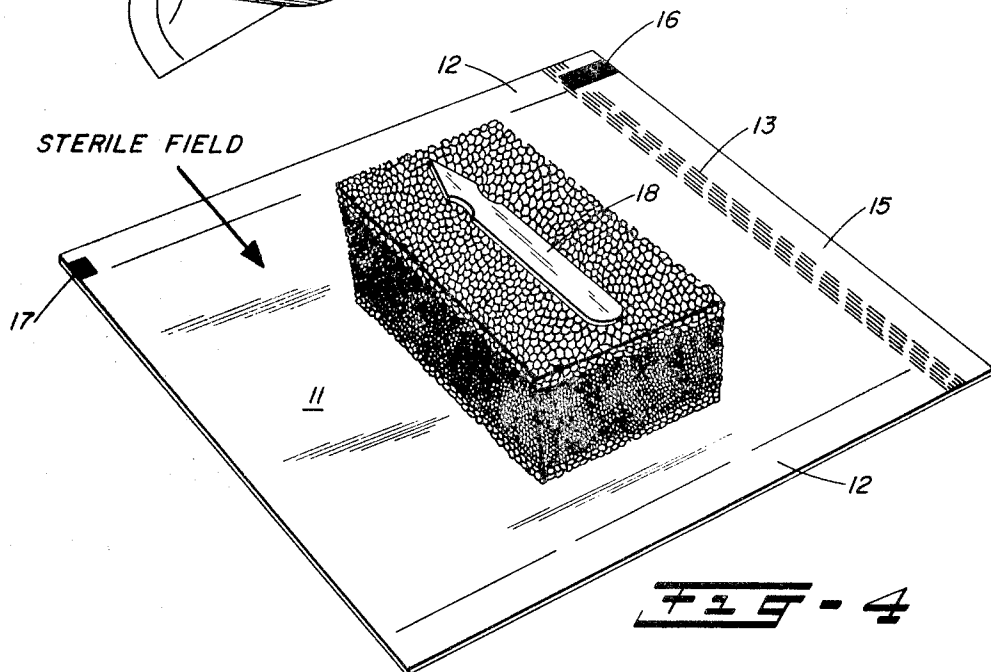


FIG-4

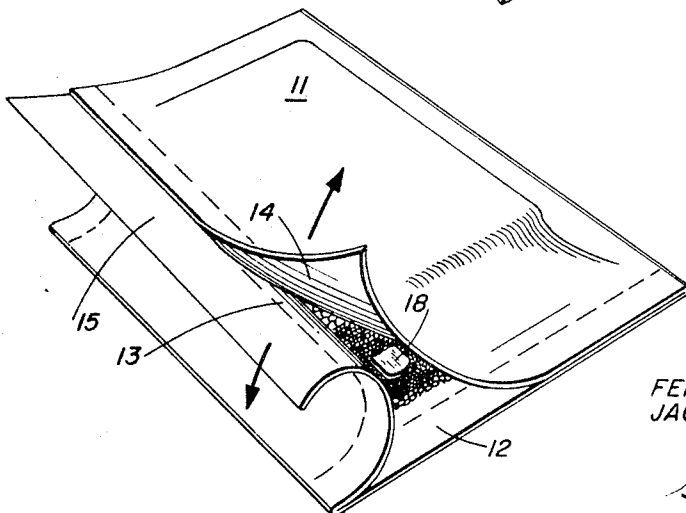


FIG-5

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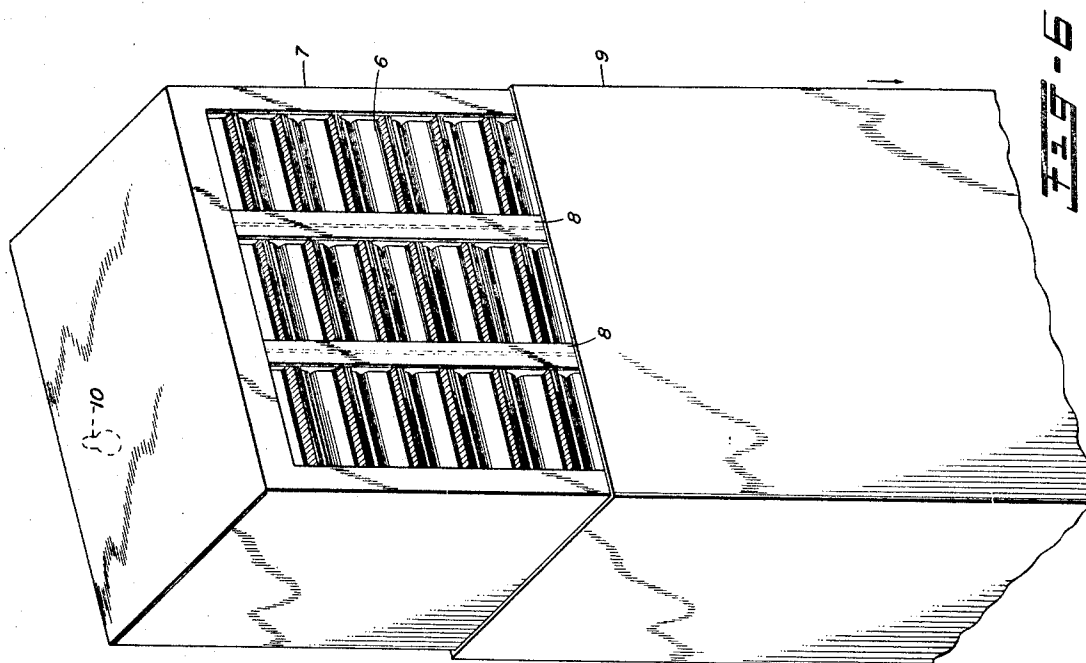
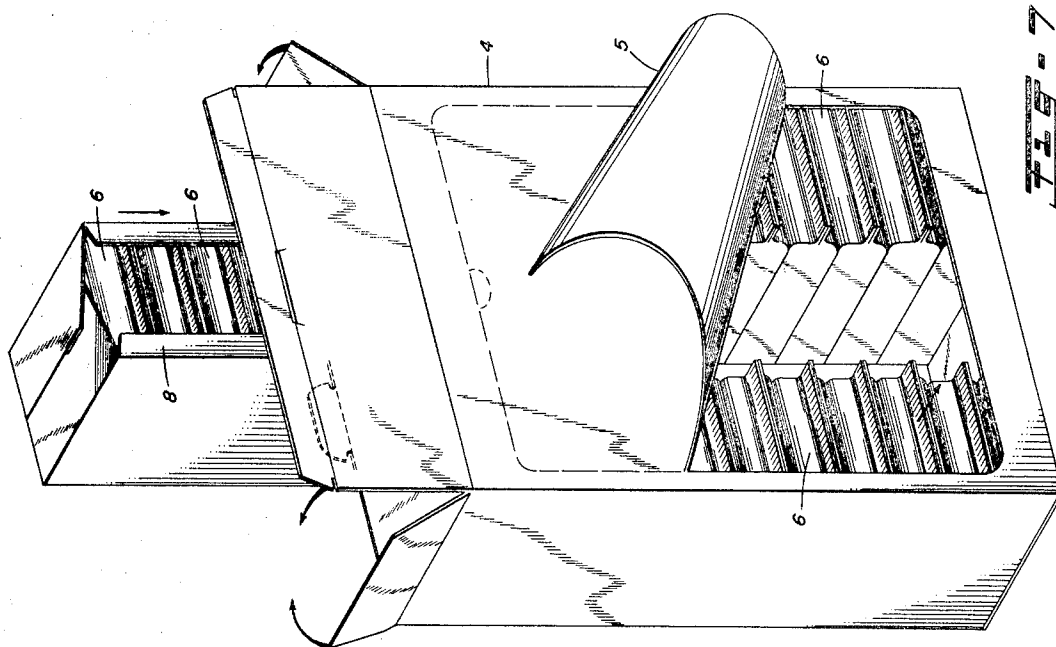
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DISPOSABLE SURGICAL SCRUB SPONGE DISPENSER

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4 Sheets-Sheet 5



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DISPOSABLE SURGICAL SCRUB SPONGE DISPENSER

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4 Sheets-Sheet 4

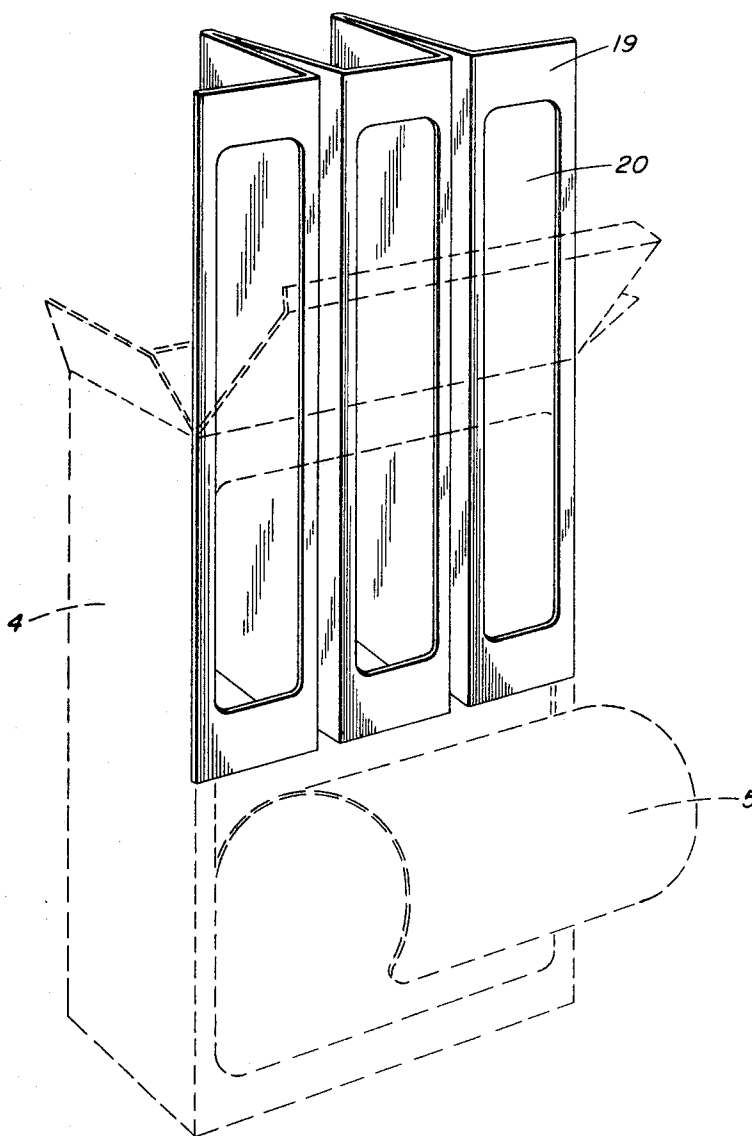


FIG. 8

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DISPOSABLE SURGICAL SCRUB SPONGE
DISPENSER

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Company, Stamford, Conn., a corporation of Maine
Continuation-in-part of application Ser. No. 554,886,
June 2, 1966. This application Aug. 5, 1968, Ser.
No. 750,206

Int. Cl. B65d 83/00

U.S. Cl. 206—56

3 Claims

ABSTRACT OF THE DISCLOSURE

A dispenser for wrapped surgical scrub sponge packages in the form of a box adapted to hold columns or rows of wrapped surgical scrub sponges and having a tearable opening in the face thereof of size permitting removal of sponges. Preferably the sponges are multi-zonal, one fine pored polyurethane foam with inter-connecting pores impregnated with a detergent composition containing antibacterial agent and another zone or two zones on either side of the fine pored foam having coarser pores so that they exert a scrubbing action when the sponge is used in surgical scrubbing, the detergent being free from abrasive materials and of low alkalinity and non-irritating to the human skin and being in amount sufficient to provide for a surgical scrubbing of 5 minutes or more, the wrapping being tight to microorganisms but permeable to cold sterilizing gases.

RELATED APPLICATION

This application is a continuation-in-part of our co-pending application Ser. No. 554,886, filed June 2, 1966, now U.S. Pat. 3,396,419, Aug. 13, 1968.

BACKGROUND OF THE INVENTION

The problem of eliminating bacteria and other microorganisms from the skin of a surgeon's hand or of a sterile nurse or other person in the operating room requiring similar standards for skin flora is a very serious one. It is standard practice in all hospitals for surgeons, sterile nurses, and the like to scrub their hands and forearms intensively before putting on sterile rubber gloves. Throughout the remainder of this specification reference will be made to surgeons as a typical example of persons requiring the scrubbing without intending it to be limited. A surgeon ordinarily scrubs his hands and forearms, usually in at least two stages, using sterilized scrub brushes and an antibacterial soap, the most common of which is one containing 2,2'-dihydroxy-3,5,6,3',5',6'-hexachloro diphenyl methane. This compound is normally referred to as hexachlorophene and the short common name will be used in the further description of the present invention. Hexachlorophene and related halogenated dihydroxy diphenyl methanes or biphenols have the property of forming a very thin coating on the skin of the surgeon's hands which does not wash off easily with water and detergent. The mechanism by which this resistant film is formed or its exact nature is not known, but it is an advantage because it maintains a low bacterial count on the surgeon's hands and forearms for a considerable time. It is also common to use a soap which contains an iodine complex, and for certain purposes this is desired because there are certain microorganisms which are much more easily attacked by iodine than by hexachlorophene. Other antibacterial agents have been used in soaps and the present invention is not limited to the two typical ones referred to above, although in a more specific aspect

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scrub sponges having antiseptic or antibacterial soaps containing either of the two compounds referred to above are preferred.

Another problem is the irritation of the surgeon's skin, for the scrubbing is quite vigorous and prolonged, typical scrubbing rituals involving 50 strokes of the brush on the hands and 30 across the nails and other more sensitive parts, followed by rinse and repeated again. If the surgeon's skin is irritated by mechanical irritation or by irritating detergents, this is not only uncomfortable and unpleasant but may result in the surgeon's skin picking up infecting agents more readily than it would have if it had not been irritated or otherwise damaged. The seriousness of skin irritation from scrub brushes is emphasized in an article in "The Lancet," vol. 269, 1955, page 791. It is customary to use very gentle soaps and detergents, staying away from high alkalinity and providing sufficient emollients to be gentle on the skin. Not too much can be done for the brushes except to provide bristles with somewhat rounded ends, such as nylon bristles. The protection of the surgeon's skin by using non-irritating, low alkaline soap is just as important in the present invention as in the normal scrubbing of the prior art and, as will be pointed out below, non-irritating soaps should be used in the sponges of the present invention.

No matter how good the soaps or brushes, there are still serious problems of bacterial and other contaminations, and the elimination of such contaminations is one of the most important features of the present invention. It should be realized that in scrubbing there are several sources of contamination. Under the pressure of hospital operation scrub brushes sometimes are not completely sterilized before they are reused, although theoretically this is planned. A far more serious source of contamination lies in the fact that soap dispensers cannot be maintained sterile even though the dispensers are cleaned and autoclaved once a day, which is the procedure in the best hospitals.

It might be thought that since the soap contains an antibacterial agent and the surgeon scrubs off a large part of the bacterial contamination on his hands and forearms during scrubbing that this would not be a serious problem. However, it has turned out to be a very serious problem because most antibacterial agents, such as hexachlorophene, are not complete bactericides in the concentrations in which they can be practically used in soaps. This is particularly serious with the resistant strains of many microorganisms which tend to develop in hospitals by reason of the extended use of antibiotics and other antibacterial agents. Such organisms are particularly bad when they get on the surgeon's skin, as they can result in serious infections in patients. This problem is well brought out in an article by Dr. Kresky, American Journal of Diseases of Children, vol. 107, April 1964, pages 363-369. In spite of daily cleaning and sterilization, dispensers for hexachlorophene detergent were found to be contaminated with dangerous, resistant forms of gram-negative bacilli about 60% of the time.

SUMMARY OF THE INVENTION

The present invention provides a dispenser for stacked, wrapped, disposable surgical scrub sponges whereby daily cleaning and sterilization of detergent dispensing equipment including scrub brushes, is eliminated, together with waste of discarded detergent, so that with the preferred cheap multi-layer sponges of the present invention the overall cost is not significantly greater and in some cases may actually represent a saving. Of course the elimination of contamination is far more important in surgery than any small saving in cost.

The present invention cannot use just any sponge; for

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example, ordinary regenerated cellulose sponges are completely unsuitable. They can be impregnated with germicidal soaps all right, but they do not have a texture permitting satisfactory scrubbing, and this is essential because the surgeon does not reduce the flora on his skin merely by the application of materials which, as hexachlorophene does, spread a thin film on the skin. It is also necessary to remove the major portion of microorganisms physically by washing off in a good detergent lather, and this requires considerable mechanical scrubbing regardless of the nature of the detergent used. It is possible to utilize certain special, very expensive, fine textured regenerated cellulose sponges, and in its broadest aspect such sponges are included in the present invention. However, it is preferred to use laminated sponges of polyester based polyurethane, such as those sold by the Foam Division of the Scott Paper Company under the designation of open-pore polyester polyurethane sponges. Preferably these sponges are made in the form of a multilayered sandwich with a relatively thick layer of fairly fine pore sponge, for example 60 pores to the inch, which retains the antiseptic soap and acts as a reservoir, maintaining sufficient material for a complete scrubbing ritual with, of course, a sufficient excess to provide a margin of safety. This thicker layer of fine pored polyurethane is softened by heat and one or more thin layers of much coarser polyurethane foam are laminated on one or both sides using suitable pressure, such as squeeze rolls. Preferably both sides of the relatively thicker, fine pored polyurethane are laminated with the coarser layers, one layer being considerably coarser than the other. For example, one layer may have pores averaging 10 to the inch and the other 20. Having two different degrees of pore size is a definite advantage because the coarser material is useful for removing greater amounts of dirt, for example from the palm of the hand when the surgeon has been working outdoors over a weekend, and the finer for parts of the hand which are more sensitive, such as the fingertips or where the hands are less heavily soiled.

It should be noted that the present invention requires very definite characteristics for the sponge the wrapper, or more properly for the combination of the sponge and the soap. The sponge must be stiff enough, it must be compatible with the soap, and it must be capable of being sterilized, for example by so-called cold sterilization with ethylene oxide gas or electron beam radiation, which is effected at temperatures not exceeding the temperatures which the scrub sponge will stand. Most polyether based polyurethanes are not suitable as they are not sufficiently stiff and in many cases tend to deteriorate on storage when in contact with the detergent. So long as it has the proper physical characteristics and compatibility with the soap and method of sterilization it is not necessary to use only a single or a particular material. Thus, for example, the center portion of a laminate may be of a material which would not be suitable for the scrubbing surfaces as it need not be as stiff since it merely has to serve as a reservoir for the detergent.

It should be noted that the present invention is not directed to the broad idea of a detergent impregnated sponge or even a sponge having more than one layer. In Pat. No. 3,112,219, Nov. 26, 1963, there is described a regenerated cellulose sponge to which a resin bound non-woven fabric layer has been fastened by adhesive, the layer containing abrasive material. The sponge is then impregnated with a melted soap gel in which a polyhydric alcohol is used as the gelling agent for the soap. After impregnation the gel is permitted to set and the sponge can be used for some time as a scoring pad to replace steel wool pads, which have also been impregnated with detergents. The scouring pad, of course, is not useful for purposes of the present invention. It is not a surgical sponge and there is not the combination of a sponge having a layer which is not abrasive but capable of scrubbing action combined with impregnation of a detergent which

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has antibacterial components and which is soft and gentle on the human skin.

In the present invention the dispenser preferably dispenses sponges of the type described above, which are sterile and provided with a wrapping that while tight to microorganisms are previous to cold sterilizing gases. The dispensers of the present invention can, of course, be used for other types of sponges.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in greater detail in conjunction with the drawings, in which:

FIG. 1 is an isometric view of an unwrapped sponge;

FIG. 2 is a section through FIG. 1 along the lines 2—2;

FIGS. 3 and 4 are isometric representations of a wrapped sponge with tabs, FIG. 3 showing it in its closed form and FIG. 4 after opening;

FIG. 5 is an isometric view of a modified wrapped sponge with a lip extending all of the way across the sponge forming a French pillow;

FIG. 6 is an isometric view of a dispensing container with wrapped sponges with tear front partly opened;

FIG. 7 is a similar view of a modified dispensing rack for dispensing sponges from the top of piles, and

FIG. 8 is an isometric view of a modified empty dispensing rack.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1 and 2 illustrate a preferred laminated sponge of the present invention. In order to illustrate the construction of the sponge more clearly, these two figures show the sponge in unwrapped form, although in actual use of course the sponge is wrapped. The center section 1 is of polyester polyurethane foam of about 60 pores to the inch of the open pore type sold by the Foam Division of the Scott Paper Company. Laminated on two sides of the sponge are two thin layers of polyester based polyurethane sponge 2 and 3, the layer 2 having coarse pores, for example about 10 to the inch and the layer 3 finer pores, about 20 to the inch. The two thin layers are laminated on the center layer by heating the former to the point where it softens and passing the composite layers through squeeze rolls. A sheet is thus formed which is then cut into sponges of suitable size. A typical desirable size is a rectangle 2 x 3 inches and 1.25 inches thick. Laminate 2 is $\frac{3}{16}$ inch and laminate 3 $\frac{1}{8}$ inch thick. Section 1 contains 10 to 15 mil. of a soap solution, which will be described in more detail in conjunction with the examples to follow. The soap may also be in a form which is not an actual solution, but, of course, when in contact with the water during scrubbing is in the form of a flowable dispersion.

FIGS. 3 and 4 illustrate one form of wrapped sponge, FIG. 3 being the wrapped sponge at the start of opening the wrapper and FIG. 4 after the wrapper has been completely opened. The wrapper is shown generally at 11 and is provided with sealing at the ends, as shown at 12. There is also a line of adhesive 13 which extends from one end seal to the other and which seals against a portion or edge 14 of the wrapper. This line of adhesive is in from the edge, leaving a lip 15 which is not coated with adhesive. At the end of the adhesive strip there is a portion 16 on the lip 15 and also a portion 17 on the wrapper. When these two points are grasped and pulled, the wrapper is pulled away from the adhesive on one end and peels off along the adhesive 13 to the other end. FIG. 3 shows the opening operation at the start and FIG. 4 shows the completely unwrapped sponge sitting on its sterile field, which is the inside of the wrapper and which has, of course, been sterilized as will be described below.

FIG. 5 shows a modified form of wrapper in which the same parts are designated by the same numbers.

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However, here the lips 14 and 15 extend up and are fastened by an adhesive, fusible or pressure sensitive material 13 to the inner portions of each lip instead of the outer portion 14 of the wrapper as shown in FIG. 3. These seals are accomplished by heat and pressure or pressure alone and comprise the sealing area. When pulled, starting at the corners, as shown by the arrows in FIG. 5, the two lips are separated and the end portions of the wrapper are peeled from the adhesive 12. When fully opened, the sponge resting on its sterile field looks substantially the same as in FIG. 4.

A small plastic fingernail cleaner 18 is provided, and it may be fastened in any suitable manner, for example stuck into the sponge as is illustrated in FIG. 5 or laid on the top of the sponge and held thereon by the wrapper as is shown in FIG. 4. In order not to confuse the drawing the fingernail cleaner has not been shown in FIG. 3.

The nature of the wrapper, which, as has been stated, must be permeable to cold sterilizing gases but tight against passage of microorganisms, will be described in more detail below in connection with one of the examples which describes a sterilization procedure.

FIG. 6 shows a dispenser 4 in the form of a box with a tear strip opening 5 on the face shown partly opened from which wrapped sponges 6 can be removed from columns formed by a flanged separating wall 8.

FIG. 7 shows a somewhat different form of dispenser with an outer sheath 9 around an inner dispenser proper 7 which can be hung on the wall by means of the opening 10. The dispenser is also provided with flanged separating walls 8 forming columns for the wrapped sponges 6. The figure shows the outer sheath 9 only partly removed. In practice of course it is completely removed and the inner dispenser hung on the wall. Sponges are removed from the top of each column. In the case of either dispenser when the surgeon or nurse requires a sponge it is removed and opened as described and is kept free from contamination other than the microorganisms which are already on the surgeon's hands and which are of course to be scrubbed away by use of the sponge.

FIG. 8 illustrates a modified form of the dispenser of the type shown in FIG. 7. Instead, however, of columns as described in the figure there is a zig zag folded cardboard separator 19 which is provided with long, vertical openings 20 of size through which wrapped sponges can be removed, in other words, the openings are somewhat wider than a wrapped sponge. In FIG. 8 the folded divider is shown partly removed from a sheath, which later with its tear strip is shown in phantom. Also, the dispenser is shown empty in order not to confuse the drawings. When the folded separator 19 is inserted to the bottom of the dispenser 4 and filled with wrapped sponges, the appearance is similar to that of FIG. 7 and the operation is, of course, the same. The construction, however, is somewhat cheaper and so presents some advantages economically.

It has been emphasized above that the present invention includes a combination of a particular kind of sponge with surfaces which are stiff enough for scrubbing but non-abrasive, with a soap which is gentle on the skin, of low alkalinity and provided with an antibacterial constituent. The invention includes the combination of wrapped sponges with dispensing means which have been described above.

It has been emphasized above that the present invention includes a combination of a particular kind of sponge, which is wrapped and which is the preferred form of sponge to be dispensed by the combination of the present invention. It is possible, of course, to dispense wrapped sponges which are not exactly as described above, and such wrapped sponges in a dispenser are included within the present invention. Two specific formulations are shown in the first two examples which are illustrative of the invention although the latter is of course not in any

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sense limited to the exact formulations therein set forth. Parts are by weight.

EXAMPLE 1

A solution of soap is formed in warm water with the following formulation:

Glycerine	8.00
Lauric acid	7.00
Triethanolamine	5.00
Sodium lauryl sulfate	14.00
Ethylene diamine tetrasodium acetate	2.00
Lanoline alcohols	3.00
Hexachlorophene	3.00
Water (70° C.)	58.00
	100.00

It will be seen that the soap is of low alkalinity and is provided with emollients, such as glycerine and lanoline alcohols. In order to prevent unwanted deposition of curds by hard water the ethylene diamine tetrasodium acetate is present as a sequestering agent which prevents formation of insoluble calcium and magnesium soaps.

The various soap ingredients perform the following functions. Glycerine is a stabilizing agent which keeps the fatty acid ester amide and the synthetic detergent in a single aqueous phase. The lauric acid and thiethanolamine react together to form a fatty acid ester amide which is a neutral non-irritating soap. Sodium lauryl sulfate is a mild synthetic detergent, and the lanoline alcohols act as emollients to replace skin oils that otherwise would be removed during washing. The pH of the formulation is between 7 and 8.

EXAMPLE 2

An iodine formulation is prepared as follows using water at room temperature:

Water	60.0
Citric acid	0.5
Condensation product of ethylene oxide and nonyl phenol	16.0
Glycerine	5.5
Adduct of lanoline alcohols and ethylene oxide	10.0
Ethylene diamine tetrasodium acetate	2.0
Iodine complex of ethylene oxide linear alkyl phenol product (20% avail. I ₂)	6.0
	100.0

The ingredients in the above example have the following functions. The glycerine, lanoline alcohol ethylene oxide adduct and the synthetic detergent, which is the condensation product of ethylene oxide and nonyl phenol, perform the same functions as the corresponding ingredients in Example 1, which have been described above. The ethylene diamine tetrasodium acetate is a sequesterent and in both formulations sequesters calcium and magnesium salts which may be present in hard water. The iodine complex is of course the antibacterial component in the formulation. The pH of the formulation is approximately 4.0.

Example 2 represents a typical surgical soap containing iodine as the antibacterial component. The iodine has stronger germicidal activity against many pathogens than does hexachlorophene but it is sometimes a little harder on the skin. It may be used wherever the problem of unwanted pathogens is particularly severe.

EXAMPLE 3

A one inch thick sheet of 60 pore per inch polyurethane-polyester foam of the open pore type was laminated first to a 1/8 inch thick sheet of 20 pore material and then to a 3/16 inch thick sheet of 10 pore material by softening the 60 pore foam by heat until it softened, applying the coarser mesh materials over the 60 pore foam and bonding the

layers firmly by passing them through squeeze rolls. Sheets of laminated foam were then cut into 2" x 3" blocks by conventional means and 11 ml. of the antibacterial soap formulation shown in Example 1 was placed in a shallow tray and drawn up into each sponge by the suction action created when the sponge was first compressed and then released. The sponges were then placed in a drying oven at 80° C. until the volatile materials were removed.

These nonsterile sponges containing the antibacterial soap were then subjected to an actual scrubbing test using the Blank modification of the Price technique as described in Surgical & Gynecological Obstetrics, vol. 91, 1950, p. 577. In addition to the test on the scrub sponge, tests were also conducted with the conventional surgeon's brush using the soap formulation presented in Example 1, and a second brush test in which the popular commercial scrubbing agent, pHisoHex, was used as the antibacterial agent. Both the scrub index and residual activity were determined with all three systems. Twenty-five separate sets of observations were made on each test. Each individual washed hands with nonmedicated bar soap for 2 minutes and then the hands were rinsed in two basins according to the Blank technique. Samples were taken and the bacterial counts determined. The individual next scrubbed his hands with one of the test agents for five minutes and samples were again taken from the rinse basins. Two hours after the five minute scrub the procedure was followed once again. The scrub indices found for the three types of materials are shown in the following table.

Table 1

	Scrub index
Standard nylon brush with pHisoHex antibacterial soap solution	25
Standard nylon brush with solution of Example 1	23
Polyurethane sponge with 11 ml. of soap solution of Example 1	24

The percentage reduction in counts and the effect of a repeat test two hours after the initial scrub are shown in Table 2.

TABLE 2

	Average Percent Reduction in Colonies	
	Immediate Post Scrub	Two Hours Post Scrub
pHisoHex plus brush	73.5	89.5
Example 1 plus brush	75.0	89.3
Example 1 impregnated in sponge	74.6	89.9

These results show that the impregnated sponge provides the same removal of bacterial as does a scrub with a conventional brush and separate liquid soap.

EXAMPLE 4

Sterilization of the unsterilized impregnated sponge described in Example 3 is effected in either of two ways. The sponge may be wrapped with a wrapper of 30 lb. greaseproof glassine paper laminated to 1 mil thickness of polyethylene film. The wrapped sponge is then exposed to ethylene oxide gas, 100% concentration at a temperature of 100°-125° F. at a pressure slightly under atmosphere for about 6 hours. The other modification involves introducing into each sponge, for example as they pass along a line on a conveyor, a small amount of a 2% solution of ethylene oxide in methanol to introduce from about 20 to 40 mg. of ethylene oxide into the sponge. The sponge is then wrapped on an automatic machine and the ethylene oxide permitted to evaporate gradually through the wrapping over a period of several days.

Sponges, sterilized with ethylene oxide by either of the above methods, were opened in a sterile room under aseptic conditions and each sponge was placed in 500 ml. of a solution containing 0.7% lecithin and 1.0 Tween 80

in a 2000 ml. Erlenmeyer flask in order to neutralize the hexachlorophene. They were kept in this solution under aseptic conditions overnight. The sponges were then transferred aseptically into thioglycollate medium contained in a 2000 ml. wide mouth Erlenmeyer flask and incubated for two weeks. No growth was obtained in any of the sample flasks, indicating that sterility had been obtained. A similar batch of material was sterilized by exposure to electron beam radiation from a 3 million volt Van de Graaff generator at a dose of 5 megarads—2½ on one side and 2½ on the other. Samples of sponges sterilized by this method were tested as described above and found to be sterile.

Sponges sterilized by any of the above methods were then subjected to the Blank modification of the Price scrub index described in Example 3. No significant differences in scrub indices and residual activities were found between the nonsterile product tested in Example 3 and the scrub sponges sterilized by the techniques of this example. This test showed that the sterilization procedure has no effect on the efficacy of the scrub sponge in reducing the bacteria count of the hands. Physical observation of the sponges showed no evidence of change in package seal, laminate bond strength, appearance or odor when compared with the nonsterile product.

EXAMPLE 5

The procedure of Example 4 was repeated, replacing the soap formulation of Example 1 with the detergent formulation of Example 2. When tested for scrub index as described above, the index was found to be 19. This somewhat higher effectiveness in removal of contaminants is, at least in part, due to the somewhat greater antibacterial activity of the iodine activity.

The sponges of Examples 4 and 5 were used by a number of persons without any sign of skin irritation. In general the coarse pore laminaiton 2 was used for scrubbing the more soiled and tougher portions of the hands and arms and the finer surface 3 for the fingernails and fingertips and in some cases by nurses where their skin was softer and more delicate and the gentler scrubbing of layer 3 was found more acceptable. In all of the tests made by practical users the sponges retained sufficient detergent so that a full scrubbing routine was possible with a small amount of excess detergent remaining in the sponge after scrubbing was completed. Disposal of the sponges presented no problem as they could be disposed of in the same way as any other surgical material which was no longer sterile.

Compatibility of the detergent with the sponge material was shown by a test where the wrapped sterilized sponges were stored for about a year. No deterioration took place and when used after this storage period excellent lather was produced and the sponges were completely satisfactory for scrubbing purposes.

In the preferred form of wrapping described above, the wrapping material is uniformly pervious to sterilizing gases. It is possible, however, to provide a package in which only a portion of the wrapping is pervious. For example, there may be tiny isolated channels which permit cold sterilizing gases to pass therethrough but which are of lengths and dimension to prevent microorganism contamination.

We claim:

1. A dispenser for dispensing wrapped disposable surgical sponges comprising a box adapted to hold columns of wrapped sterile surgical scrub sponges, a tearable opening in the face thereof of size permitting removal of sponges one at a time, said opening being smaller than the face of the box adjacent all edges, whereby an untorn wrapped sponge retaining flange remains on all edges, thereby retaining the wrapped sponges against accidental displacement, and a plurality of columns of wrapped sterile surgical scrub sponges packed in said box.

2. A dispenser according to claim 1 comprising an

inner separator with flanged walls, for retaining a plurality of columns of wrapped surgical sponges.

3. A dispenser according to claim 2 in which the inner separator is formed of folded material which separates columns of sponges but does not completely surround any column, and simultaneously reinforces the box.

References Cited

UNITED STATES PATENTS

2,005,924	6/1935	Wilson	229—17
2,067,749	1/1937	Zimmerman et al	206—44.12

2,840,080	6/1958	Clark	206—56
2,906,642	9/1959	Dennis	15—244
7,990,948	7/1961	Zackheim	206—46
2,999,265	9/1961	Duane et al.	206—46
3,092,249	6/1963	Chapman	206—46
3,171,820	3/1965	Volz	15—244
3,229,813	1/1966	Crowe et al.	206—63.2
3,306,437	2/1967	Nelson	206—56
3,377,643	4/1968	Tengetal	15—244

WILLIAM T. DIXSON, Jr., Primary Examiner