

United States Patent

[11] 3,587,578

[72]	Inventor	Jack M. Walker Chattanooga, Tenn.
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[73]	Assignee	Chattanooga Pharmacal Company Chattanooga, Tenn.

Primary Examiner—L. W. Trapp
Attorney—Lamont Johnston

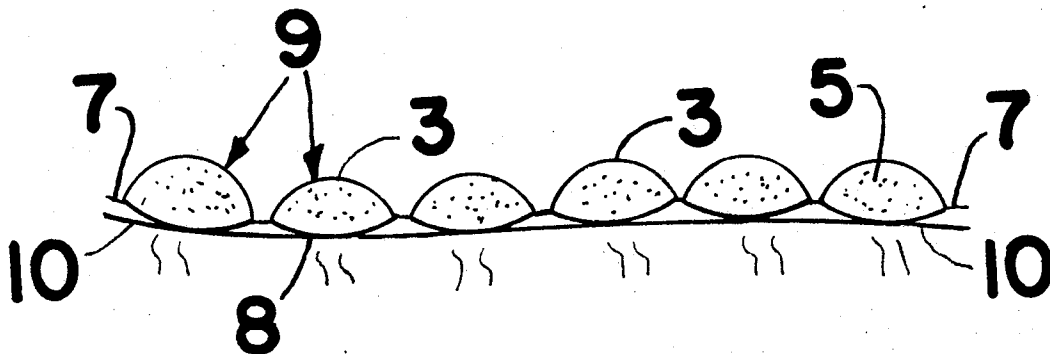
**[54] PACK FOR APPLYING THERAPEUTIC MOIST
HEAT
8 Claims, 9 Drawing Figs.**

[52]	U.S. Cl.....	128/268, 128/402
[51]	Int. Cl.....	A61j 3/80
[50]	Field of Search.....	128/254, 258, 268, 399—403

[56] **References Cited**
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ABSTRACT: A pack for applying therapeutic moist heat containing a sorptive material between a water and water vapor pervious fabric side placed toward the anatomy of a patient and a water and water vapor impervious material, which is relatively elastic and stretchable compared with the fabric, forming the other side of the bag. The material of the outer side of the bag is a good heat insulator and is molded to form a plurality of troughs so that, when it is sealed to the inner side of the bag, usually a fabric, a plurality of separate compartments holding the sorptive material are formed. Steam or water vapor can escape only through the fabric side toward the anatomy of a patient and heat loss on the outer side of the bag is minimized. Also, the elastic, stretchable, material of the outer side of the bag stretches considerably more than the fabric, thereby enabling the fabric side to be in close contact over most of the area of the fabric with the anatomy of the patient and to bend toward itself on a rather small radius, so as to fit closely around the body parts of small diameter, such as small wrists, arms, ankles and legs.



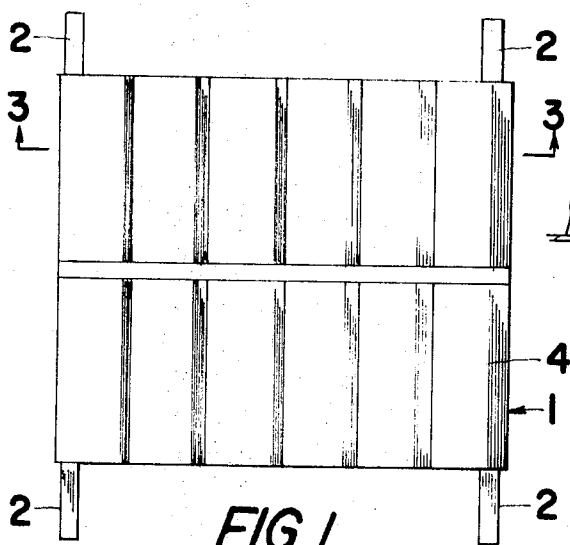


FIG. 1

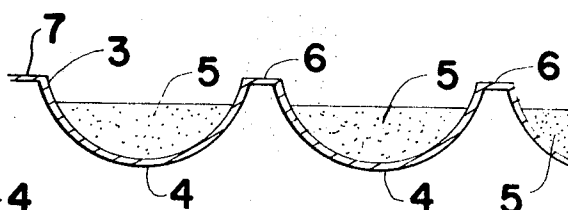


FIG. 2

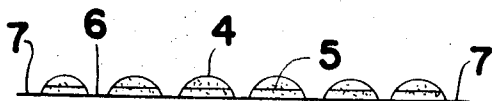


FIG. 3

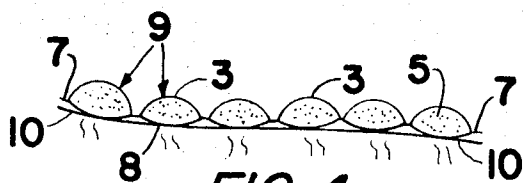


FIG. 4

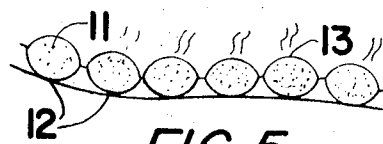


FIG. 5

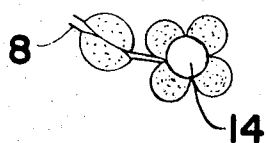


FIG. 6

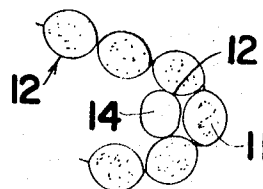


FIG. 7

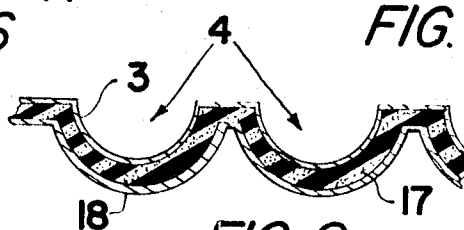


FIG. 9

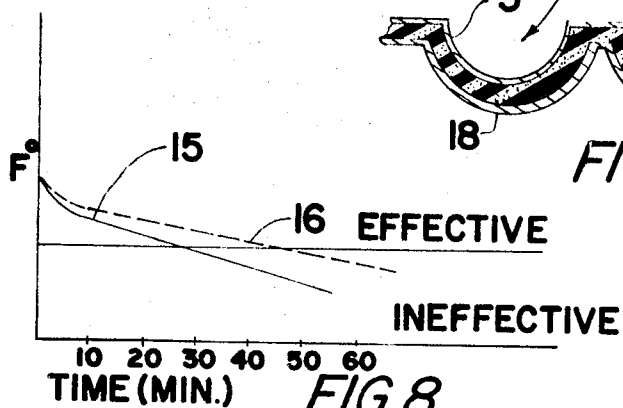


FIG. 8

INVENTOR
Jack M. Walker
 BY *Lamont Johnston*
 ATTORNEY

PACK FOR APPLYING THERAPEUTIC MOIST HEAT

BACKGROUND OF THE INVENTION

Moist heat has therapeutic superiorities for a wide variety of conditions, such as neuromuscular, strains, sprains, arthritic conditions, post-surgery problems, orthopedic conditions, etc.

Packs or compresses to be heated in boiling water have been made heretofore of fabric. See, for example, Jensen U.S. Pat. No. 2,710,008. Up until now, steam packs, as they have been manufactured for years, have consisted of a two-sided fabric envelope, one size of which being 10 inches x 12 inches in outer dimensions, sewn into sections in a quiltlike fashion, with a small amount of bentonite, about 1 ounce, in each of these sections. This bentonite filler readily adsorbs a large volume of water when a steam pack is immersed in water. Thus, when immersed and heated in water, the tremendous adsorptive power of the bentonite gel filler adsorbs and holds the water in a suspension, preventing it from running and dripping from the hydrated, water-swollen, mass. This amorphous mass inside each section has a consistency similar to that of tooth paste. Actually, this material, when hydrated in a steam pack in this fashion, consists of around 80 percent water. The two fabric sides of the envelope of these conventional steam packs are of a weave sufficiently tight to prevent the hydrated gooey mass from escaping, but are still porous or pervious enough to permit the hot saturated air or steam to escape through the fabric. This is the principle of applying moist heat to the flesh of an area being treated. Normally, layers of Turkish toweling will be interposed between the heated steam pack and the flesh of the area being treated. Steam from the heated steam pack readily passes through the Turkish toweling, and reaches the flesh of the area being treated. These towel layers serve as spacers, and can be added or removed, to vary the applied heat according to the needs and tolerance of the patient and his particular condition.

A limitation of that type of compress is that, as shown in FIG. 3 of the Jensen patent, hydration of the sorbent material within the compartments of the compress causes the sorbent to swell and to bulge out the compartments considerably on both sides of the compress, so that only a small part of the compress comes into contact, either through Turkish toweling or directly, with the anatomy of a patient. This reduces the effectiveness of the heat. This extreme swelling of the fabric of the conventional steam pack is undesirable, for it creates a series of ridges toward the patient, which does not give a maximum treatment surface. Instead, only the high points of the convex sections are near the patient.

Also, the bulges being pronounced and close together, the compress cannot be bent around a part of circular cross section which is of small diameter, because the bulges bump into each other, are relatively rigid and prevent such bending of the compress into a circle of small diameter. In the case of the conventional steam pack, with convex swelling to both sides, it is difficult to form it into small diameters readily for applying to small round areas like the wrist, small arms, small ankles, small legs, etc.

Since the conventional compress is made of fabric on both sides, at least as much steam, water vapor and heat escape from the compress on the side away from the patient as are transmitted on the inner side to the patient. Thus, both sides of the fabric envelope or cover of conventional steam packs, as they have been made and used for some years, are of a porous or pervious material, permitting the hot water vapor saturated air or steam to escape from the hydrated heated filler through both sides of the heated steam pack. Thus, the heat in the pack is lost at a relatively rapid rate. Also, the water vapor or steam escaping to the outside moistens outer towels, bed linens, bed clothing, etc.

Other heat-transfer packs for therapeutic use have their outer walls on both sides made entirely of a plastic or rubber. This does not provide to the anatomy of the patient a true moist heat application and is not so effective therapeutically as is a moist heat application of steam or hot water vapor to the skin of a patient in accordance with the present invention.

SUMMARY OF THE INVENTION

The improved version of the steam pack is made as follows: one side of the envelope, the side which is applied toward the patient, is made of a fabric which is steam or water pervious, similar to the fabric used on both sides of a conventional steam pack. This is to permit the steam from the hydrated gel to escape through the fabric and reach the flesh of the area being treated. The opposite side of the envelope, the side away from the patient, in this improved version, is an impervious plastic material, polyvinyl chloride for instance, which absolutely prohibits the escape of saturated air or steam from the hydrated, heated, filler in that direction. This plastic side of the envelope is the side away from the patient. Also, and of utmost importance, this plastic side reduces the escape of heat in the direction away from the patient, adding to the duration of effectiveness and efficiency of the steam pack. Both of these results are tremendous improvements in this product's operation, function, and efficiency.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of a pack embodying the features of this invention;

FIG. 2 is a cross-sectional view showing one of the initial stages in the manufacture of a pack made in accordance with this invention;

FIG. 3 is a cross-sectional view on the line 3-3 of FIG. 1 showing a pack with its sorptive material in a dry condition, before it is hydrated;

FIG. 4 is a view similar to FIG. 3 showing a pack made according to this invention with its sorptive material in a wet swelled condition, after it is hydrated, and in contact with the anatomy of a patient;

FIG. 5 is a view similar to FIG. 4 showing a pack of conventional construction having both its sides made of fabric with its sorptive material in a wet swelled condition, after it is hydrated; and in contact with the anatomy of a patient;

FIG. 6 is a cross-sectional view showing how a pack made according to this invention fits closely to the surface of a part of the anatomy which is round in cross section and of small diameter, such as small wrists, arms, ankles and legs;

FIG. 7 is a view similar to FIG. 6 showing how a pack of conventional construction having both its sides made of fabric does not fit closely to the surface over a wide area of contact but only at swelled up points of tangency and even then only around cylindrical body members of relatively large diameters; and

FIG. 8 is a graph showing approximately temperature against time for a conventional pack and for a pack made in accordance with this invention.

FIG. 9 is a cross-sectional view, similar to FIG. 2, showing a modified form of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

There is shown in FIG. 1 of the drawings a top plan view of a compress or pack embodying the features of this invention, the pack being generally indicated by the numeral 1. The pack may be provided with suitable handling straps or loops 2, by which it may be grasped for easy removal from or returning to boiling water for heating and by which it may be applied to the area of the anatomy to be treated. The top surface, or side, 3 of the pack, i.e., the side which is away from the anatomy of a patient, is formed of a water impervious material which is flexible and elastic or stretchable. Such material may be one of a number of different materials, such as synthetic rubber or various plastic materials including vinyl plastic, vinyl resin, polyvinyl acetate, polyvinyl chloride, polyethylene and other related resinous materials.

The vinyl or other suitable material is vacuum formed or molded into a plurality of bulged sections or troughs 4, as shown in FIG. 2. Each of these sections forms a well or compartment into which is placed a small amount, perhaps about an ounce, of dry aluminum silicate, bentonite gel 5. Between

the sections or troughs 4, the top side 3 is formed with relatively narrow flat surfaces or ridges 6, which are on the same level as the outer edges 7 of the top side.

A sheet of porous, woven, fabric 8 is next placed over the top side 3, while it is inverted, as shown in FIG. 2, for manufacturing purposes. The fabric 8 is then heat-sealed by a dielectric, high frequency, sealing tool, sealing only along the narrow raised ridges 6 and the outer edges 7 of the vinyl or other material, as shown in FIG. 3. This completely seals in the gel filler material and the steam pack is then ready for use.

When in use, the completed pack is immersed in boiling water or at least very hot water and heated in the same manner as heating is done of the conventional steam pack having two pervious fabric sides. The hot water penetrates the porous fabric 8, enabling the bentonite gel to hydrate fully and to swell into an amorphous mass, as shown in FIG. 4.

Because the impervious side 3 of the pack is of an elastic, stretchable, material, heating and swelling of the bentonite gel causes the sections or troughs 4 to swell outward considerably, as indicated at 9, this swelling out being on the side away from the patient's body. At the same time, the fabric side 8, which is relatively inelastic, is swelled outwardly, i.e., inwardly toward the body, only a relatively small amount, as indicated at 10. The vacuum forming of the vinyl backing into a series of bulges permits the swelling of the gel to occur toward the outside, the side away from the patient, thus bulging out, i.e., inwardly toward the body of the fabric on the patient side of the various sections is minimized.

To use the steam pack, it is lifted from the hot water bath, wrapped in a Turkish towel or in one of the specially designed terry cloth covers which are available, and applied to the patient. As shown in FIG. 4, the fabric sides 10 which are toward the anatomy of a patient, are bulged out only relatively little and make heating contact, either through Turkish toweling or directly, with the skin of a patient throughout substantially the entire area of the fabric 8. With the improved steam pack, there is only a slight bulge of the fabric on the patient side of the steam pack. In addition to the already formed bulges in the plastic backing, the stretchability, or elasticity, of the plastic permits further swelling in that direction, away from the patient. This results in a desirable improved effect, i.e., the swelling into convex ridges of the fabric toward the patient is minimized, exposing a more uniform, flatter, surface on the treatment side of the pack. Also, the impervious side 3 of the pack, which is the side away from the patient, is a good heat insulator and is impervious to water, water vapor or steam, so that heat is not lost to any appreciable extent through that side.

In contrast to this, a conventional steam pack having both of its sides made of fabric is shown in FIG. 5 after it has been hydrated. From FIG. 5, it will be seen that the hydrated and swollen conventional pack 11 is in contact with the body of a patient only at the relatively small points of tangency 12 of the compartments of the pack. Thus, the conventional pack is much less efficient in transfer of heat from the pack to the body of a patient than is a pack made in accordance with my invention.

Also, since the conventional pack has a fabric outer cover 13, a considerable amount of heat and water vapor or steam are lost through the outer side of the pack, away from the patient, so that a large proportion of such heat is wasted and the conventional pack must be heated much more often than a pack made in accordance with my invention. To extend the duration of effective moist heat is of extreme importance from standpoints of labor saving and efficacy. Many times, it is desirable to have an almost continuous moist heat application. Thus, the time intervals between the necessary replacings of a cooled steam pack with a newly heated one are tremendously extended.

In addition, the conventional pack, allowing water or water vapor to escape, causes sheets, bedspreads, pillows, blankets, mattresses, bed clothing, etc., to become wet, to the discomfort and inconvenience of the patient and of the person attending him.

As shown in FIG. 6, a small body part of round cross section, such as a wrist, is shown in outline at 14. A pack made in accordance with this invention will be applied with the fabric side 8 toward the body of the patient, and because of the relatively small amount of swelling of the fabric side at 10, after hydrating in hot water, the pack can be bent into a circle of small diameter and can be brought with a large part of its inner surface to bear upon the round body member.

In contrast, a conventional steam pack with both sides made of fabric is shown in FIG. 7 and it will be seen that, because of the bulging of the compartments of the conventional pack on both sides, it cannot be bent in a circle of small diameter, so that it cannot be bent to make many of its compartments 11 come into contact with the wrist 14, along the inner contact points 12 of the pack.

As shown in FIG. 8, a graph of temperature against time based upon actual experiment, it will be seen that the curve 15, which represents a conventional pack having both sides made of fabric, will remain at a temperature which is effective for therapeutic purposes only about 25 to 30 minutes. In contrast, a pack made in accordance with the present invention, with an impervious, heat-insulating, outer surface and a pervious fabric inner surface to be placed adjacent to the skin of a patient will, as shown by curve 16, remain at a temperature effective for therapeutic purposes about 40 to 50 minutes. Thus, it is clear that there is an increase in the duration of effective use of a pack made in accordance with this invention over the duration of effective use of a conventional pack of up to 100 percent.

In FIG. 9, there is shown a modification of the invention in which the water impervious side of the pack includes an inner layer of a flexible and elastic water impervious material 3, as in the other form of the invention, formed into bulged sections 4. There is also, next to the inner layer 3, an intermediate layer 17 of a heat-insulating, closed cell foam material, such as flexible polyurethane and an outside sheet 18 of water impervious material like that of the inner layer 3. This construction provides even better heat insulation.

It will be apparent to those skilled in the art that various changes may be made in the invention, without departing from the spirit and scope thereof, and therefore the invention is not limited by that which is shown in the drawings and described in the specification, but only as indicated in the appended claims.

I claim:

1. A pack for use in applying therapeutic moist heat to an area of a patient's anatomy comprising a water sorbent which will expand and sorb a large volume of water, a water impervious material shaped with a plurality of outwardly extending bulges therein forming the outer side of the pack and a sheet of flexible water pervious material which is relatively inelastic compared with the water impervious material forming a substantially flat inner side of the pack in contact with the body, both the water pervious and the water impervious material being impenetrable by the sorbent and the sides being secured together to confine the sorbent.

2. The article according to claim 1 in which the pervious material and the impervious material are sealed together at appreciably spaced intervals to form compartments.

3. The article according to claim 1 in which the pervious material is a fabric.

4. The article according to claim 1 in which the impervious material is selected from the groups of plastic materials including synthetic rubber, vinyl plastic, vinyl resin, polyvinyl acetate, polyvinyl chloride, polyethylene and other related resinous materials.

5. The article according to claim 1 in which the water pervious inelastic material maintains contact with the anatomy of a patient throughout substantially its entire area when the sorbent is hydrated with hot water.

6. The article according to claim 1 in which the water pervious inelastic material is readily bendable about body portions of small diameter and maintains contact throughout substantially its entire area with irregularities in the anatomy of a patient when the sorbent is hydrated with hot water.

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7. The article according to claim 1 in which the impervious side of the pack comprises an inside sheet of water impervious material, an intermediate layer of heat-insulating closed-cell foam and an outside sheet of water impervious material.

8. A pack for use in applying therapeutic moist heat to an area of a patient's anatomy comprising a water sorbent, which will expand and sorb a large volume of water, a flexible and elastic water impervious material forming the outer side of the pack which will stretch and bulge out considerably away from

the body when the sorbent is hydrated, and a flexible water pervious material which is relatively inelastic compared with the water impervious material forming a substantially flat inner side of the pack in contact with the body and which will bulge inwardly toward the body very little, both the water pervious and the water impervious material being impenetrable by the sorbent and the sides being secured together to confine the sorbent.

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