

United States Patent

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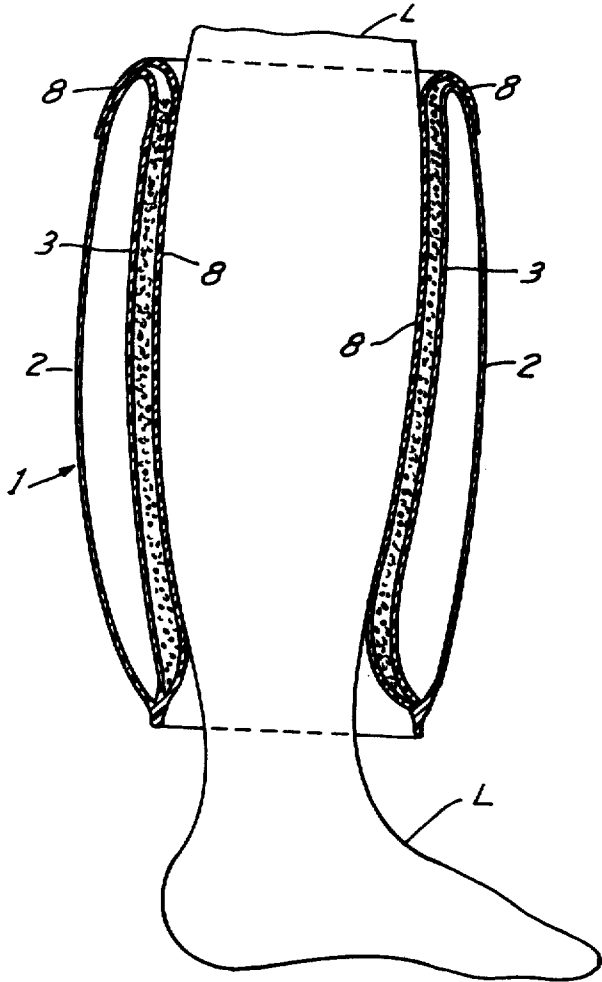
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[54] COMBINED SPLINT AND COOLANT CONTAINER
7 Claims, 6 Drawing Figs.

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A61f 7/10
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—2.6; 128/(Inflatable Splint Digest), 87, 254, 258,
402, 403, 82.1, (Inquired)

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ABSTRACT: The combined splint and container comprises an inflatable splint having inner and outer walls defining an inflatable chamber and a flexible container wall disposed in face to face spaced relation to the inner wall and connected thereto at its margins and extending from one end thereof to and beyond the other end, so as to form with the inner wall a container for coolant. The splint and container are placed in embracing relation to a member to be treated with the container, filled with coolant, usually crushed ice, in contact with the member. While held in embracing relation, the splint is inflated by oral pressure so as to stiffen the splint and force the container wall into embracing relation, under preselected pressure contact, to the member about the entire periphery of the embraced portion of the member. The splint and container may be of permanent sleeve shape or a sleeve having separable lateral margins which are detachably held together when the splint is installed and are separable so that the sleeve can be opened along one side for convenience in installing it on the member.



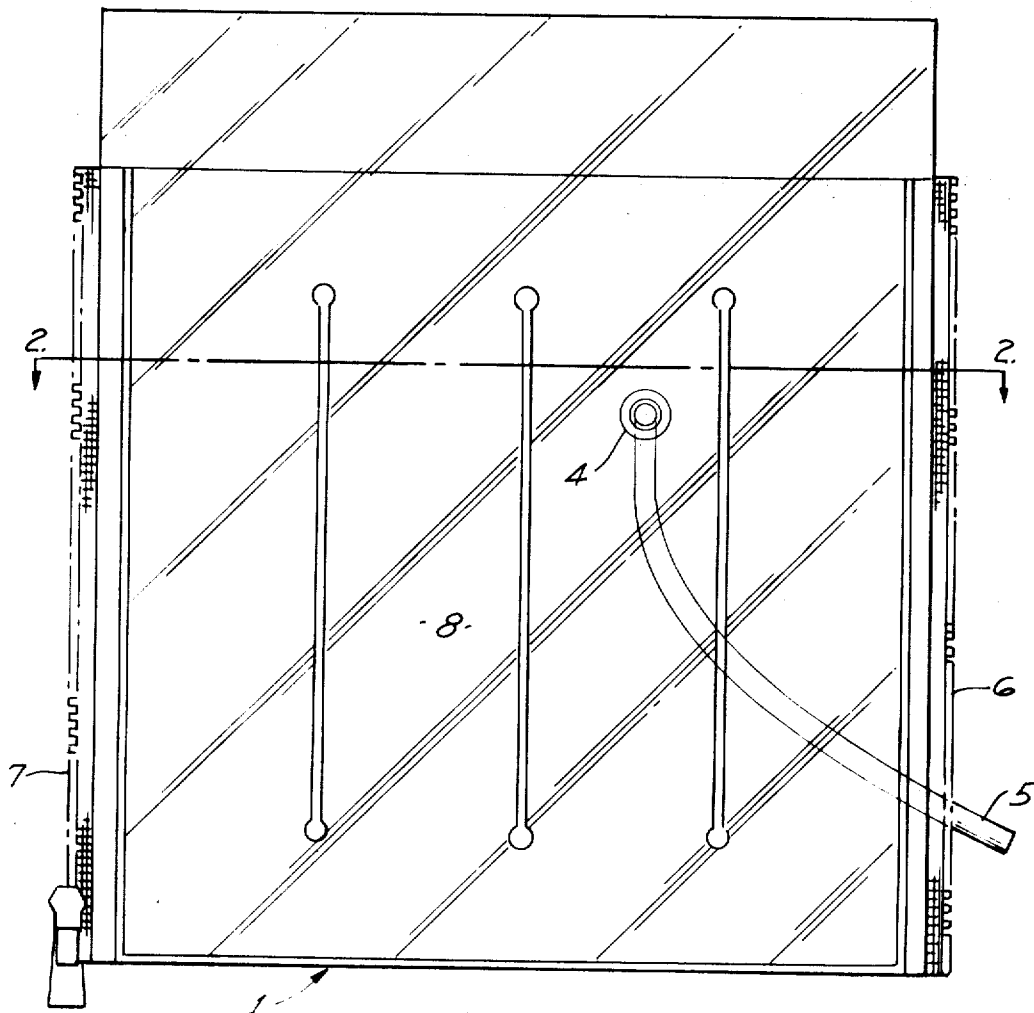


Fig. 1.

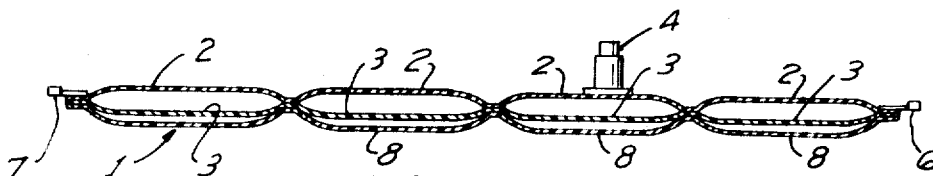
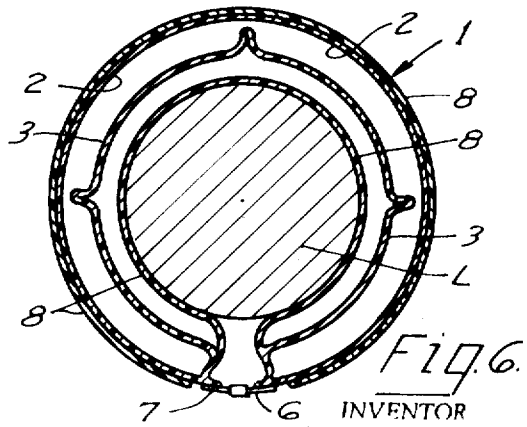
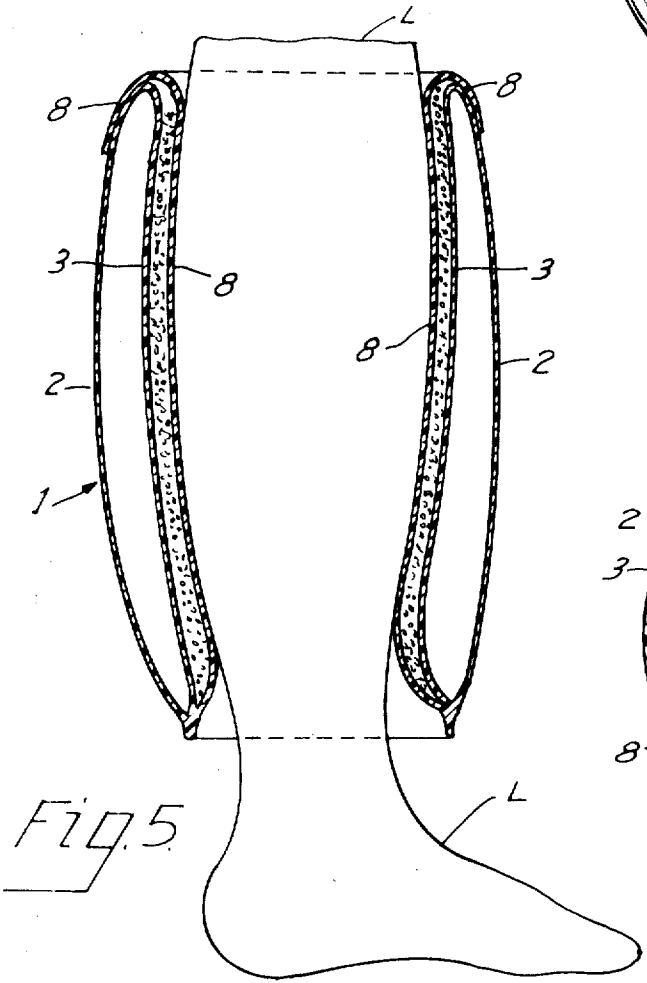
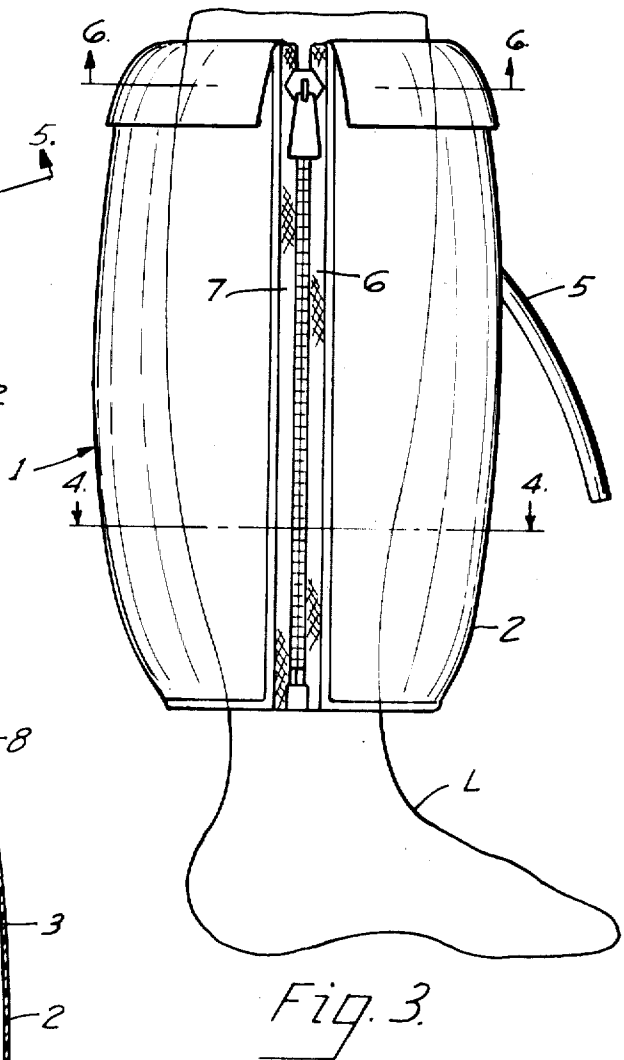
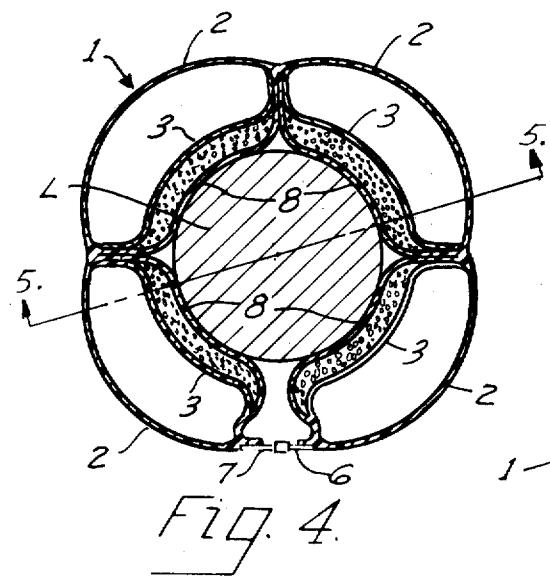


Fig. 2.

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COMBINED SPLINT AND COOLANT CONTAINER

This invention relates to a combined inflatable splint and coolant container and more specifically to a combined inflatable splint and ice container, for use in supporting injured members, particularly limbs or members with broken bones, in an immobile position and for concurrently applying coolant thereto for reducing the pain and for reducing bleeding in those cases wherein the damage to the limb or member includes bleeding wounds.

The invention is an improvement in the usual inflatable pressure-type bandages or splints, both in the manner of its construction and in the manner of application of the coolant.

Various specific objects and advantages of the invention will become apparent from the following description in which reference is made to the drawings, in which:

FIG. 1 is a front elevation of the splint and coolant container in open, flat condition, and only slightly inflated to separate the various walls from each other;

FIG. 2 is a cross-sectional view of the combined splint and coolant container taken on the line 2-2 in FIG. 1;

FIG. 3 is a front elevation of the combined splint and container installed in inflated condition with crushed ice coolant in the container, with its lateral margins detachably connected together so as to form a sleeve in embracing relation to a leg of a user;

FIG. 4 is a cross-sectional view of the combined splint and container taken on the line 4-4 of FIG. 3;

FIG. 5 is a longitudinal sectional view taken on the line 5-5 in FIG. 4; and

FIG. 6 is a cross-sectional view taken on the line 6-6 in FIG. 3.

Referring to the drawings, the combined pressure splint and coolant container comprises an inflatable splint, indicated generally at 1, composed of an outer wall 2 and inner wall 3. The walls 2 and 3 are impervious, flexible, substantially inelastic sheets of synthetic organic plastic, such as vinyl chloride or other types of synthetic organic settable plastics. The walls 2 and 3 are disposed in face to face relation and secured together in sealed relation about their peripheral margins by heat bonding or otherwise so as to provide an inflatable air chamber therebetween. An inflating stop valve 4 of any conventional type, and provided with an air tube 5, is connected to the outer wall 2 so as to permit inflation of the splint by air pressure delivered orally.

The two opposite lateral margins of the walls are provided with releasable fastening means, respectively, such as indicated at 6 and 7, for holding the splint in sleeve form during use. The fastening means may be in the form of the conventional slide fasteners, the usual hooks and laces, or other means, as the specific type of releasable fastener forms no part of the present invention.

Disposed in face to face relation to the inner wall 3 of the splint is a container wall 8 which at the lateral margins and one end margin, is bonded to the corresponding margins of the splint in sealed relation. The wall 8 is substantially coextensive laterally with the splint and extends from the one end at which it is bonded to the splint and beyond the opposite end of the splint. The wall 8 is of flexible substantially inelastic sheet material, of the general type used for the walls 2 and 3, and preferably is impervious so that liquid from the melting ice can be contained.

The wall 8, as mentioned, extends beyond the end of the splint opposite from the end to which it is attached, and at this opposite end is unconnected to the splint except for a very limited area at the lateral margins of the splint. This provides a means for shielding the limb or member, such as the leg L of the user as indicated in FIGS. 3, 4, and 5, on which the splint is being applied so that the ice, or water therefrom, can be kept out of the space between the embraced leg L and the container wall.

In order to maintain proper distribution of the coolant, especially crushed ice, and retain it in place, the walls 2, 3, and 8 are bonded together at spaced locations transversely of the length of the splint. These bonded areas extend continuously

endwise of the splint from a point beginning in spaced relation to the closed end of the container partway toward the other end of the splint. The walls 2, 3, and 8 are unbonded at these laterally spaced locations for 2 or 3 inches from the closed end of the container and for 2 or 3 inches from the end of the splint at the open end of the container.

The splint may be applied by securing it in sleeve form in embracing relation to the member to which it is applied, with the wall 8 in contact with the member. The crushed ice usually is introduced into the container before application of the splint to the member.

After the splint is placed in embracing relation to the member, it is inflated orally until the inner wall 8 of the container is brought into embracing relation to the member under the desired pressure throughout the length of the splint. The division of the coolant container into separate sleeves or pockets, even though the pockets communicate with each other adjacent their ends of the container, hold the solid coolant, such as crushed ice, in place, and also cause the ice itself to assist in stiffening the splint. Further, they permit more localized application of coolant when desired. With the container filled, however, the pockets adjust themselves during inflation of the splint so that the coolant is applied about the entire periphery of the embraced portion of the member. If desired, the lateral margins of the splint can be permanently connected together, so that the splint and the container remain permanently in the form of sleeves.

In general, the material is flexible but inelastic so that the stiffness obtained in the inflated splint can be proportional to the pressure of inflation. The valve may be of the push-pull type or any other type, and the specific nature thereof forms no part of the present invention.

The combination of the crushed ice and the inflation pressure assist in reducing bleeding. The application of the wall 8 of the container to the member can be maintained during the reduction of the volume of ice due to melting by occasionally additionally inflating the splint so that the wall 8 is maintained at all times in proper contact with the member embraced by the splint.

While the combined splint and container has been disclosed as applied to the leg of a user, obviously it may be modified for use on other members without changing the essential cooperative relations of its parts.

Also, other treating material than crushed ice may be used so that heating as well as cooling effects can be obtained.

I claim:

1. A combined pressure splint and coolant container comprising:

an elongated inflatable splint having inner and outer walls, respectively, of impervious, flexible, substantially inelastic material sealed together at their margins so as to define therebetween an air receiving and holding chamber, and which are sealed together at elongated narrow areas which extend lengthwise of the walls and are spaced apart from each other transversely of the walls, and which areas terminate endwise in spaced relation to the ends of said walls, to divide the air receiving chamber into a plurality of compartments in communication with each other at their ends, and inlet means for permitting introduction of air into the chamber for inflating the splint and for preventing the escape of air through said means;

a container wall of flexible sheet material in face to face spaced relation to said inner wall and connected thereto along part only of its periphery so as to define between the inner wall and container wall a container for holding treating material, which container has an opening to permit filling and emptying; and

said splint and container wall being constructed and arranged so that the splint and container wall can be placed in embracing relation with an injured member of a user with the container wall juxtaposed against the embraced member.

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2. The structure according to claim 1 wherein said container wall has elongated areas extending endwise of the splint, bonded to the inner wall of the splint partway only of the length of the splint at a plurality of locations spaced apart from each other transversely of the length of the splint.

3. The structure according to claim 2 wherein each of said bonded areas terminates in spaced relation to both ends of the splint.

4. The structure according to claim 1 wherein said container wall is impervious and imperforate and is bonded in sealed relation to the inner wall of the splint along the entire lateral margins and one end margin of the container wall.

5. The structure according to claim 1 wherein the container wall extends endwise of the splint outwardly beyond the end of the splint opposite from said one end margin of the container wall sufficiently so that the portion so extending can be folded over the splint at said one end and overlies the outer peripheral margin of the splint at said one end.

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6. The structure according to claim 1 wherein the container wall is attached at its lateral margins and at said one end margin, to the splint over a total area of such a limited extent transversely and lengthwise of the splint that the space between the container wall and splint is open at said opposite end for substantially the entire extent of the splint transversely of the length of the splint.

7. The structure according to claim 1 wherein the splint has two sealed lateral margins extending lengthwise of the splint and separable from each other:

releasable connecting means are connected to the splint and are manually operable to hold said margins in fixed position relative to each other and to release said margins, selectively; and

the container wall has lateral margins separated from each other and bonded in fixed position to said lateral margins of the splint, respectively.

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